358
59

United States
Department of
Agriculture

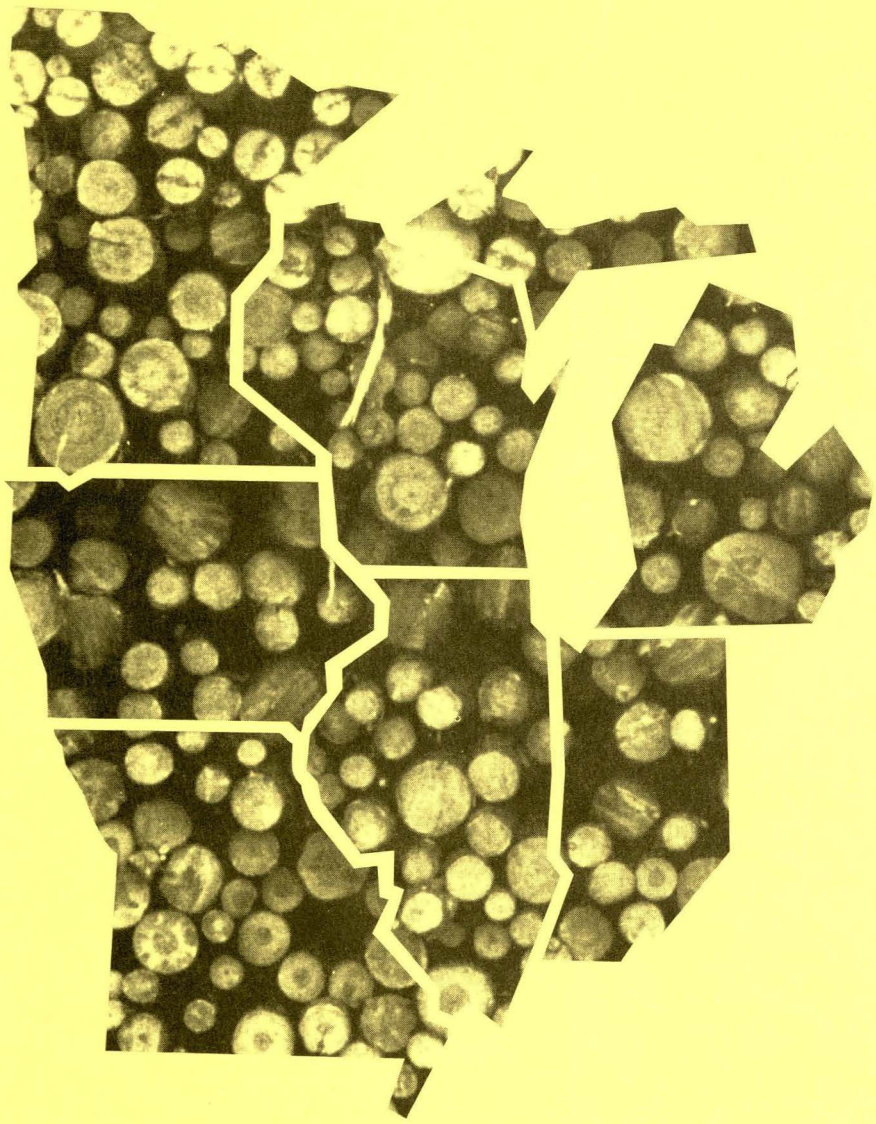
Forest
Service

North Central
Forest Experiment
Station

Resource Bulletin
NC-159

Pulpwood Production in the North-Central Region, 1992

Ronald L. Hackett and Ronald J. Piva



North Central Forest Experiment Station
Forest Service—U.S. Department of Agriculture
1992 Folwell Avenue
St. Paul, Minnesota 55108
Manuscript approved for publication December 5, 1994
1994

CONTENTS

Page

Lake States 2
Production 2
Receipts 15
Industry Trends and Analysis 15
Central States 18
Production 18
Receipts 20
Industry Trends and Analysis 21
Appendix 21

Pulpwood Production In The North-Central Region, 1992

Ronald L. Hackett and Ronald J. Piva

NOTE: This report includes all primary products made from reconstituted wood fiber. In addition to wood pulp, this includes particleboard and engineered lumber products[1] made from chips, shavings, wafers, flakes, strands, and sawdust. This report presents the production by county of the raw fiber material delivered to mills. Thus, these data report only that portion of the timber harvest used as raw material and do not necessarily reflect the volume of growing stock harvested.

Pulpwood constitutes more than half the industrial timber products harvested annually in the Lake States (Michigan, Minnesota, and Wisconsin) and is an important product in the Central States (Illinois, Indiana, Iowa, and Missouri).

Current detailed information about pulpwood production[2] is necessary for intelligent planning and decisionmaking in wood procurement, forest resource management, forest industry development, and scientific studies.

Since 1979, we have included logs, bolts, and wood residue used in manufacturing flake board, wafer board, oriented strand board, and medium density fiberboard in this annual report. Starting with this 1992 report, we will also include engineered lumber. Together, these products are called particleboards, and all mills manufacturing these boards will be called particleboard mills in this paper. Wood used at particleboard mills is identical or nearly identical to wood used at pulp mills; therefore, including this wood in our study provides a more accurate estimate of demand for pulpwood-like material.

Particleboard mills were in their infancy before 1979 and used primarily aspen and wood residue. Therefore, data for these mills do not distort roundwood use trends for other species nor preclude comparing 1992 survey results with those of 1978 and previous years.

Pulp and particleboard mills using North Central States timber in 1992 reported their pulpwood receipts[3] by species group and county of origin. This report presents the results of the survey, analyzes the data, compares results with those of 1991 or earlier years, and discusses trends in pulpwood production and use.

The Lake States and Central States are discussed separately because the timber types in each area are different, the flow of wood between the areas is nominal, and more detailed data on pulpwood production and receipts in the Central States might reveal the operations of individual mills. This is the 34th annual report of the pulpwood harvest in Lake States counties and the 33rd annual report of the Central States harvest.

Ronald L. Hackett, Research Forester, received a B.S. degree in forest resources from the University of Minnesota. He joined the Forest Service in December 1974, and has been working with the North Central Station's Forest Inventory and Analysis Unit since.

Ronald J. Piva, Forester, received a B.S. degree in forest management from the University of Missouri-Columbia. He joined the Forest Service in 1989, and has been working with the North Central Station's Forest Inventory and Analysis Unit since.

---

[1] *U.S. Forest Products Laboratory. 1974. Wood handbook: wood as an engineering material. Agric. Handb. 72. Washington, DC: U.S. Department of Agriculture, Forest Service: 23-27. (Revised)*

[2] *Pulpwood production, determined from mill receipts, is the annual volume of pulpwood cut, plus the annual wood residue volume produced by sawmills, veneer mills, etc., used for pulp, particleboard, wafer board, oriented strand board, medium density fiberboard, or engineered lumber.*

[3] *Pulpwood receipts are the volume of wood received by mills in a specific State or region, regardless of the geographic source.*

Several mills purchase their pulpwood based on weight rather than volume. Conversion factors used in the Lake States to convert green tons of pulpwood to standard cord equivalents are shown in the Appendix. Conversion factors used in the Central States are shown in footnote 1 of table 4.

LAKE STATES

Production

- Pulpwood production as a whole increased to 8.8 million cords[4] in 1992 from 8.6 million cords in 1991, a rise of 2 percent (table 1). Of each cord produced, 93 percent came from roundwood (including chips from roundwood) and 7 percent came from residue[5] from wood-using plants (fig. 1).

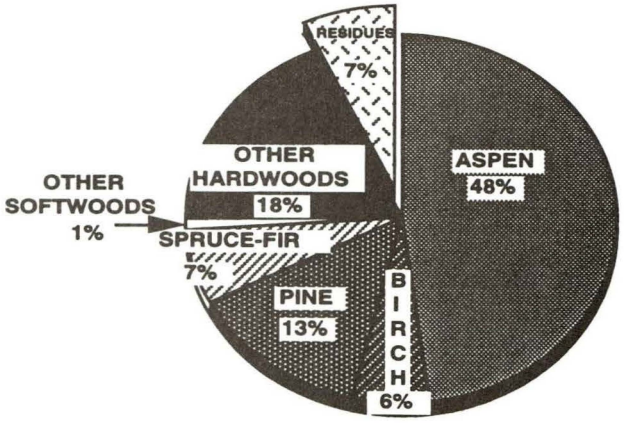


Figure 1.—*Lake States pulpwood production by species group, 1992.*

- Principal species harvested were aspen (4.2 million cords), jack pine (732 thousand cords), hard maple (554 thousand cords), and white birch (474 thousand cords).

- Hardwoods constituted 73 percent of the total pulpwood production.

- Aspen remained the dominant pulpwood harvested—48 percent of the total.

- Softwood roundwood production dropped slightly to 1.86 million cords in 1992. Pulpwood production from softwood residue dropped to 36 thousand cords, an 18-percent decrease from the previous year (fig. 2).

- Whole-tree chip[6] (WTC) production, which makes up 6 percent of the total pulpwood production in the Lake States, increased 9 percent to 559 thousand cords (fig. 3).

- Michigan is the major producer of whole-tree chips in the Lake States with 361 thousand cords (65 percent of the WTC production) (fig. 4).

- Jack pine was the predominant softwood species used in WTC in 1992, making up 74 percent of the softwood WTC production and 10 percent of the total WTC production.

Michigan

- Michigan pulpwood production dropped 3 percent to 2.9 million cords in 1992 (fig. 5).

[4] *All references to cords are in standard cords. A standard cord is 128 cubic feet of wood, bark, and air space.*

[5] *Residue is the byproduct from sawmills, veneer mills, cooperage mills, and other wood-using mills that is used for pulping and particleboard. Residue includes slabs, edgings, veneer cores, sawdust, woodflour, and chips manufactured from slabs, edgings, and veneer cores.*

[6] *Pulpwood produced from chipping entire trees (all portions of the trees above ground, except the stumps).*

Table 1.--Production and imports of pulpwood, Lakes States, 1992 1/

(In standard cords, unpeeled)

Species and destination	Production by State 2/				Imports			Total receipts
	Michigan	Minnesota	Wisconsin	Regional total	Other U.S. 3/	Canada	Total imports	
Cedar								
Michigan	6,137	--	216	6,353	--	--	--	6,353
Total	6,137	--	216	6,353	--	--	--	6,353
Balsam fir								
Michigan	67,061	--	2,382	69,443	--	--	--	69,443
Minnesota	1,742	183,778	11,305	196,825	--	--	--	196,825
Wisconsin	6,312	--	47,531	53,843	--	--	--	53,843
Exported 4/	7,577	3,236	--	10,813	--	--	--	10,813
Total	82,692	187,014	61,218	330,924	--	--	--	330,924
Hemlock								
Michigan	33,967	--	1,186	35,153	--	--	--	35,153
Wisconsin	2,816	--	27,805	30,621	--	--	--	30,621
Total	36,783	--	28,991	65,774	--	--	--	65,774
Jack pine								
Michigan	211,097	--	5,592	216,689	--	--	--	216,689
Minnesota	--	95,360	4,417	99,777	--	--	--	99,777
Wisconsin	74,813	5,884	337,049	417,746	--	--	--	417,746
Exported 4/	--	8,016	--	8,016	--	--	--	8,016
Total	285,910	109,260	347,058	742,228	--	--	--	742,228
Red pine								
Michigan	55,496	--	1,455	56,951	--	--	--	56,951
Minnesota	--	13,631	1,067	14,698	--	--	--	14,698
Wisconsin	7,727	4,002	303,225	314,954	223	--	223	315,177
Exported 4/	--	4,808	--	4,808	--	--	--	4,808
Total	63,223	22,441	305,747	391,411	223	--	223	391,634
White pine								
Michigan	13,802	--	473	14,275	--	--	--	14,275
Minnesota	--	4,777	--	4,777	--	--	--	4,777
Wisconsin	472	6	41,731	42,209	--	--	--	42,209
Total	14,274	4,783	42,204	61,261	--	--	--	61,261
Spruce								
Michigan	13,335	--	461	13,796	--	--	--	13,796
Minnesota	1,360	112,903	1,547	115,810	--	--	--	115,810
Wisconsin	44,976	28,772	38,516	112,264	--	--	--	112,264
Exported 4/	10,589	4,624	--	15,213	--	--	--	15,213
Total	70,260	146,299	40,524	257,083	--	--	--	257,083
Tamarack								
Michigan	5,686	--	208	5,894	--	--	--	5,894
Wisconsin	1,360	1,400	4,498	7,258	--	--	--	7,258
Total	7,046	1,400	4,706	13,152	--	--	--	13,152
Total softwood roundwood								
Michigan	406,581	--	11,973	418,554	--	--	--	418,554
Minnesota	3,102	410,449	18,336	431,887	--	--	--	431,887
Wisconsin	138,476	40,064	800,355	978,895	223	--	223	979,118
Exported 4/	18,166	20,684	--	38,850	--	--	--	38,850
Total	566,325	471,197	830,664	1,868,186	223	--	223	1,868,409
Residue, softwood								
Michigan	70,390	--	10,588	80,978	--	--	--	80,978
Minnesota	--	25,651	1,390	27,041	--	622	622	27,663
Wisconsin	3,313	892	50,837	55,042	102,593	5,823	108,416	163,458
Exported 4/	--	682	--	682	--	--	--	682
Total	73,703	27,225	62,815	163,743	102,593	6,445	109,038	272,781
All softwoods								
Michigan	476,971	--	22,561	499,532	--	--	--	499,532
Minnesota	3,102	436,100	19,726	458,928	--	622	622	459,550
Wisconsin	141,789	40,956	851,192	1,033,937	102,816	5,823	108,639	1,142,576
Exported 4/	18,166	21,366	--	39,532	--	--	--	39,532
Total	640,028	498,422	893,479	2,031,929	102,816	6,445	109,261	2,141,190

(Table 1 continued on next page)

(table 1 contined)

Species and destination	Production by State 1/				Imports			Tota receipts
	Michigan	Minnesota	Wisconsin	Regional total	Other U.S. 2/	Canada	Total imports	
Ash								
Michigan	24,183	--	2,244	26,427	--	--	--	26,427
Minnesota	--	3,050	1,216	4,266	--	--	--	4,266
Wisconsin	1,760	--	67,487	69,247	--	--	--	69,247
Total	25,943	3,050	70,947	99,940	--	--	--	99,940
Aspen								
Michigan	908,678	--	48,404	957,082	--	--	--	957,082
Minnesota	--	1,916,865	25,204	1,942,069	--	22,806	22,806	1,964,875
Wisconsin	124,428	42,575	1,142,403	1,309,406	--	--	--	1,309,406
Exported 4/	--	25,374	--	25,374	--	--	--	25,374
Total	1,033,106	1,984,814	1,216,011	4,233,931	--	22,806	22,806	4,256,737
Balsam poplar								
Michigan	75,761	--	5,086	80,847	--	--	--	80,847
Minnesota	--	85,478	--	85,478	--	5,051	5,051	90,529
Wisconsin	63	--	1,171	1,234	--	--	--	1,234
Total	75,824	85,478	6,257	167,559	--	5,051	5,051	172,610
Basswood								
Michigan	27,124	--	2,943	30,067	--	--	--	30,067
Minnesota	--	3,681	1,451	5,132	--	--	--	5,132
Wisconsin	1,962	--	46,460	48,422	--	--	--	48,422
Total	29,086	3,681	50,854	83,621	--	--	--	83,621
Beech								
Michigan	36,849	--	3,829	40,678	--	--	--	40,678
Wisconsin	29	--	619	648	--	--	--	648
Total	36,878	--	4,448	41,326	--	--	--	41,326
White birch								
Michigan	155,191	--	67,382	222,573	--	--	--	222,573
Minnesota	--	3,453	--	3,453	--	--	--	3,453
Wisconsin	3,473	21,597	222,758	247,828	--	--	--	247,828
Total	158,664	25,050	290,140	473,854	--	--	--	473,854
Yellow birch								
Michigan	19,561	--	1,699	21,260	--	--	--	21,260
Wisconsin	4,573	--	15,217	19,790	--	--	--	19,790
Total	24,134	--	16,916	41,050	--	--	--	41,050
Cottonwood								
Wisconsin	63	--	1,172	1,234	--	--	--	1,234
Total	63	--	1,172	1,234	--	--	--	1,234
Elm								
Michigan	2,143	--	545	2,688	--	--	--	2,688
Wisconsin	953	--	24,283	25,236	--	--	--	25,236
Total	3,096	--	24,828	27,924	--	--	--	27,924
Hard maple								
Michigan	301,128	--	51,480	352,608	--	--	--	352,608
Wisconsin	26,272	--	174,762	201,034	--	--	--	201,034
Total	327,400	--	226,242	553,642	--	--	--	553,642
Soft maple								
Michigan	247,816	--	26,659	274,475	--	--	--	274,475
Minnesota	--	11,574	4,589	16,163	--	--	--	16,163
Wisconsin	10,939	171	141,653	152,763	--	--	--	152,763
Total	258,755	11,745	172,901	443,401	--	--	--	443,401
Red oak								
Michigan	55,619	--	2,594	58,213	--	--	--	58,213
Wisconsin	1,681	--	67,944	69,625	--	--	--	69,625
Total	57,300	--	70,538	127,838	--	--	--	127,838
White oak								
Michigan	25,264	--	--	25,264	--	--	--	25,264
Wisconsin	470	--	13,675	14,145	--	--	--	14,145
Total	25,734	--	13,675	39,409	--	--	--	39,409
Other hardwoods								
Michigan	25,973	--	2,548	28,521	--	--	--	28,521
Wisconsin	759	--	9,995	10,754	--	--	--	10,754
Total	26,732	--	12,543	39,275	--	--	--	39,275

(Table 1 continued on next page)

(Table 1continued)

Species and destination	Production by State 1/				Imports			Total receipts
	Michigan	Minnesota	Wisconsin	Regional total	Other U.S. 2/	Canada	Total imports	
Total hardwood roundwood								
Michigan	1,905,290	--	215,413	2,120,703	--	--	--	2,120,703
Minnesota	--	2,024,101	32,460	2,056,561	--	27,857	27,857	2,084,418
Wisconsin	177,425	64,343	1,929,599	2,171,367	--	--	--	2,171,367
Exported 4/	--	25,374	--	25,374	--	--	--	25,374
Total	2,082,715	2,113,818	2,177,472	6,374,005	--	27,857	27,857	6,401,862
Residue, hardwoods								
Michigan	149,877	--	15,184	165,061	15,672	--	15,672	180,733
Minnesota	--	60,079	3,886	63,965	--	--	--	63,965
Wisconsin	4,230	--	215,931	220,161	--	--	--	220,161
Total	154,107	60,079	235,001	449,187	15,672	--	15,672	464,859
All hardwoods								
Michigan	2,055,167	--	230,597	2,285,764	15,672	--	15,672	2,301,436
Minnesota	--	2,084,180	36,346	2,120,526	--	27,857	27,857	2,148,383
Wisconsin	181,655	64,343	2,145,530	2,391,528	--	--	--	2,391,528
Exported 4/	--	25,374	--	25,374	--	--	--	25,374
Total	2,236,822	2,173,897	2,412,473	6,823,192	15,672	27,857	43,529	6,866,721
Total all roundwood								
Michigan	2,311,871	--	227,386	2,539,257	--	--	--	2,539,257
Minnesota	3,102	2,434,550	50,796	2,488,448	--	27,857	27,857	2,516,305
Wisconsin	315,901	104,407	2,729,954	3,150,262	223	--	223	3,150,485
Exported 4/	18,166	46,058	--	64,224	--	--	--	64,224
Total	2,649,040	2,585,015	3,008,136	8,242,191	223	27,857	28,080	8,270,271
Total all residues								
Michigan	220,267	--	25,772	246,039	15,672	--	15,672	261,711
Minnesota	--	85,730	5,276	91,006	--	622	622	91,628
Wisconsin	7,543	892	266,768	275,203	102,593	5,823	108,416	383,619
Exported 4/	--	682	--	682	--	--	--	682
Total	227,810	87,304	297,816	612,930	118,265	6,445	124,710	737,640
All wood material								
Michigan	2,532,138	--	253,158	2,785,296	15,672	--	15,672	2,800,968
Minnesota	3,102	2,520,280	56,072	2,579,454	--	28,479	28,479	2,607,933
Wisconsin	323,444	105,299	2,996,722	3,425,465	102,816	5,823	108,639	3,534,104
Exported 4/	18,166	46,740	--	64,906	--	--	--	64,906
Total	2,876,850	2,672,319	3,305,952	8,855,121	118,488	34,302	152,790	9,007,911

1/ Table may not add to totals due to rounding.

2/ Vertical columns of figures under the box heading "Production by State" present the amount of pulpwood cut in each State.

3/ Mostly Western States.

4/ Pulpwood shipped to mills outside of region.

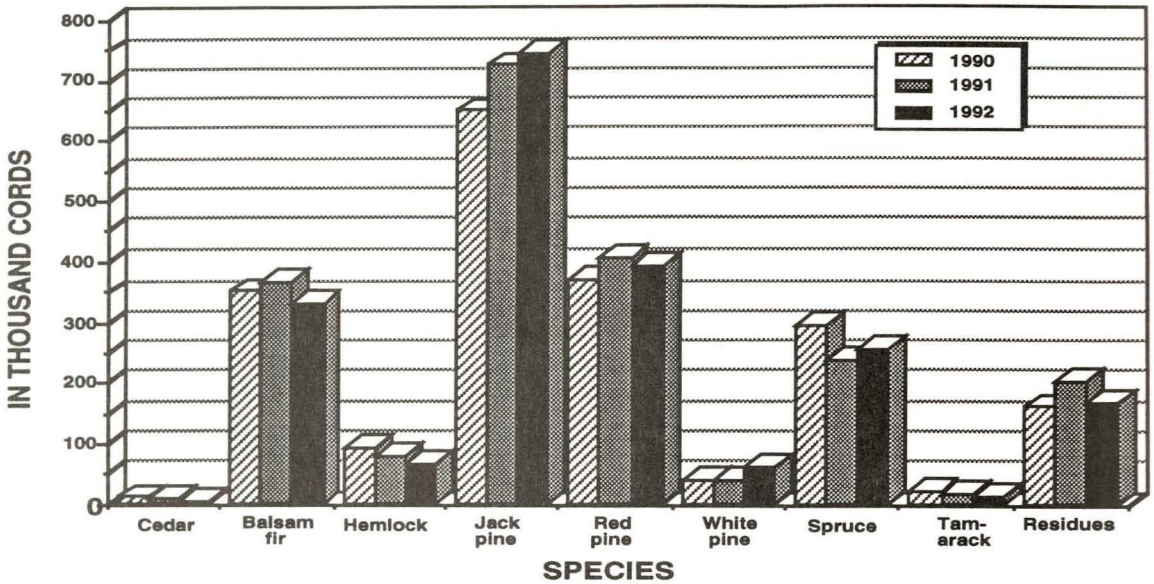


Figure 2.—*Softwood pulpwood production in the Lake States, 1990-1992.*

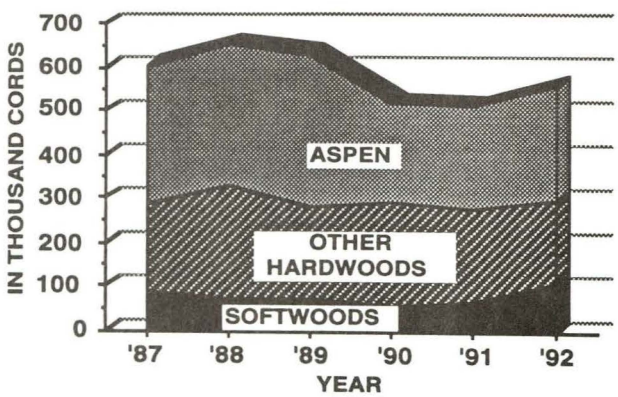


Figure 3.—*Whole-tree chip production in the Lake States, 1987-1992.*

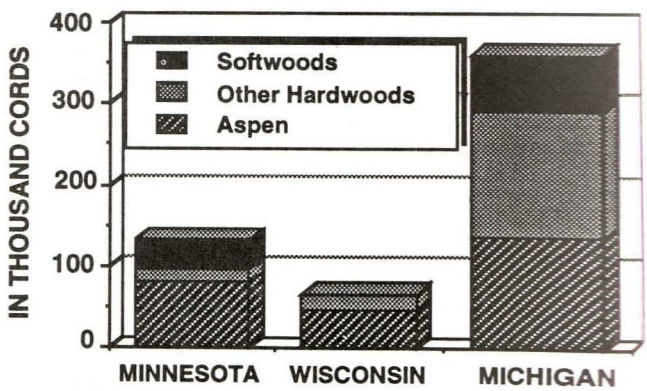


Figure 4.—*WTC production by State in the Lake States, 1992.*

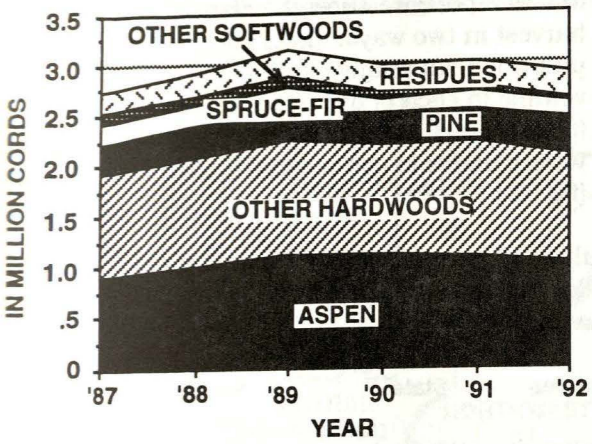


Figure 5.—*Michigan pulpwood production by species group and residues, 1987-1992.*

- The Western Upper Peninsula was the top producing region in the State with 38 percent of the roundwood harvested (fig. 6).

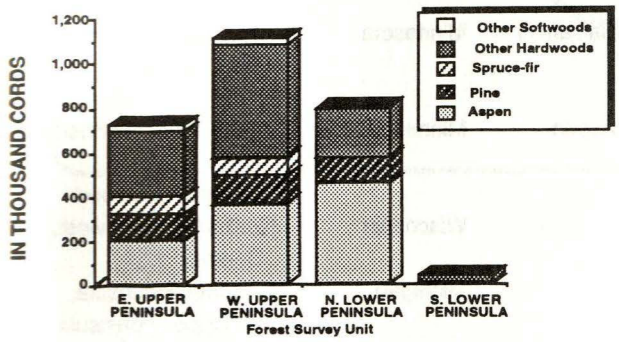


Figure 6.—*Michigan pulpwood production by Forest Survey Unit and species groups, 1992.*

- Marquette County in the Western Upper Peninsula was the top producer in Michigan with 350 thousand cords.

Minnesota

- Pulpwood production including residues increased 12 percent to 2.7 million cords in 1992 (fig. 7).

- The Northern Pine Unit remained the top pulpwood producing area in the State with 1.3 million cords (fig. 8).

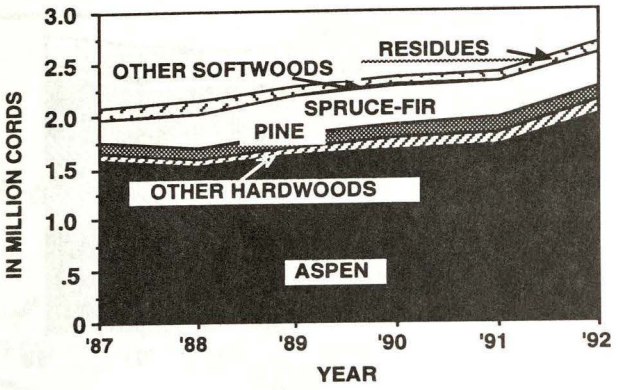


Figure 7.—*Minnesota pulpwood production by species group and residues, 1987-1992.*

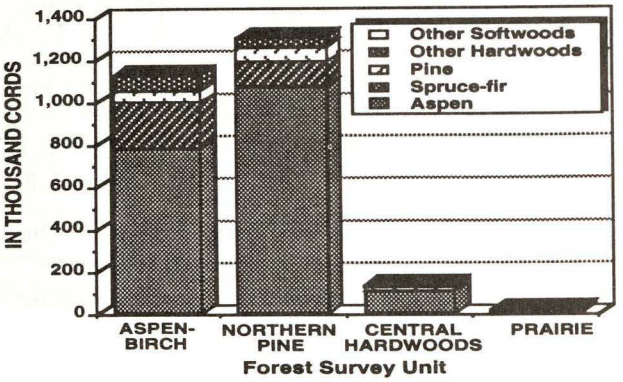


Figure 8.—*Minnesota pulpwood production by Forest Survey Unit and species group, 1992.*

- Aspen pulpwood production inc 1 to a new high of 1.98 million cords, a 16-percent increase over 1991.

- Softwood roundwood production declined 7 percent or 34 thousand cords from the previous year.

- St. Louis County, in the Aspen-Birch Unit, remained the top producing county with 540 thousand cords, a 9-percent increase from 1991.

Wisconsin

- Pulpwood production in Wisconsin increased 5 percent to 3.3 million cords in 1992 (fig. 9).

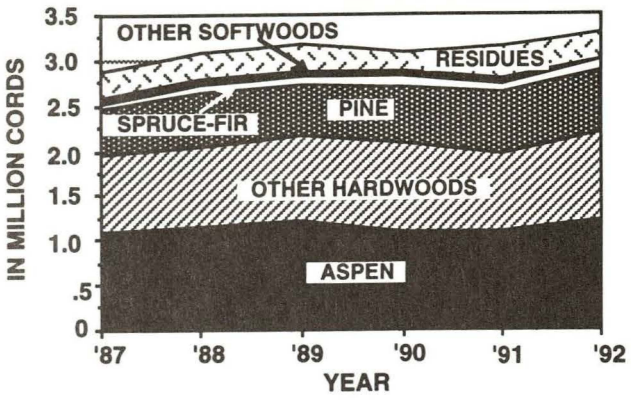


Figure 9.—*Wisconsin pulpwood production by species group and residues, 1987-1992.*

- Aspen harvest increased 12 percent to 1.2 million cords in 1992.
- Pine pulpwood production in Wisconsin accounted for 27 percent of the total harvest.
- The Northwest and Northeast Units were the top pulpwood producing areas in the State with 1.2 million cords and 1.1 million cords, respectively (fig. 10).
- Bayfield County in the Northwest Unit was the top pulpwood producing county in the State with 197 thousand cords, a 2-percent increase in harvest from 1991.

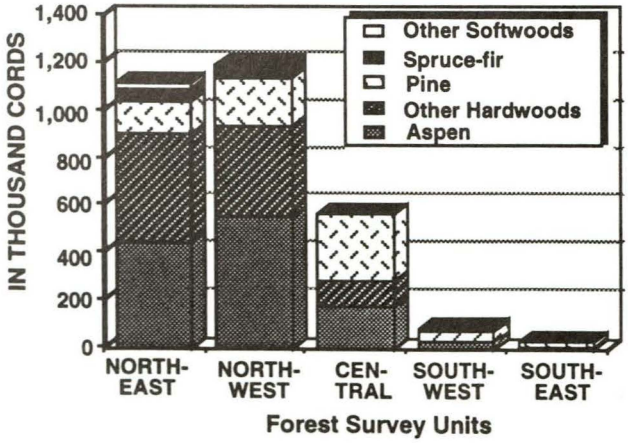


Figure 10.—*Wisconsin pulpwood production by Forest Survey Unit and species group, 1992.*

- In this report, we show the distribution of the harvest in two ways: first, the amount of pulpwood cut relative to the growing-stock volume in each of five major pulpwood species (fig. 11); and, second, the amount of pulpwood relative to commercial timberland area (fig. 12).

Pulpwood harvesting was most intensive in the following areas by species: (80,000 cords or more)

Species	State	Survey Unit
Jack pine	Wisconsin	Northwest, Central
	Michigan	E. Upper Peninsula, W. Upper Peninsula, Northern Lower Peninsula
	Minnesota	Northern Pine
Red pine	Wisconsin	Central
Spruce	Minnesota	Aspen-Birch
Balsam fir	Minnesota	Aspen-Birch, Northern Pine
Aspen	Minnesota	Aspen-Birch, Northern Pine Central Hardwood
	Wisconsin	Northeast, Northwest, Central
	Michigan	E. Upper Peninsula, W. Upper Peninsula, N. Lower Peninsula

- Cutting of certain species may exceed net growth in several Survey Units of the Lake States. This disparity is probably due to disease and mortality occurring in these species. Harvesting of overmature stands of timber may be another reason. Future field surveys should help clarify these points.

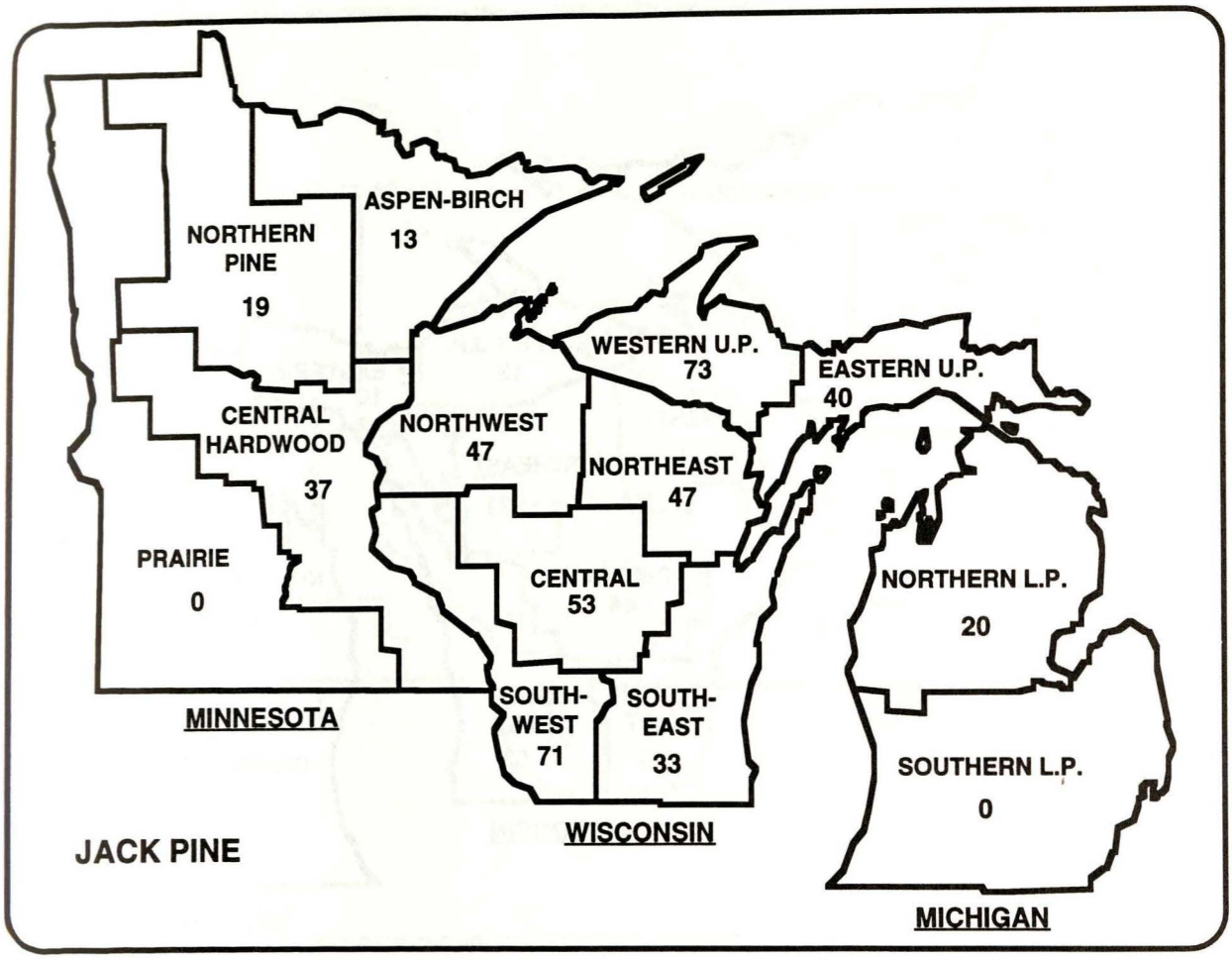
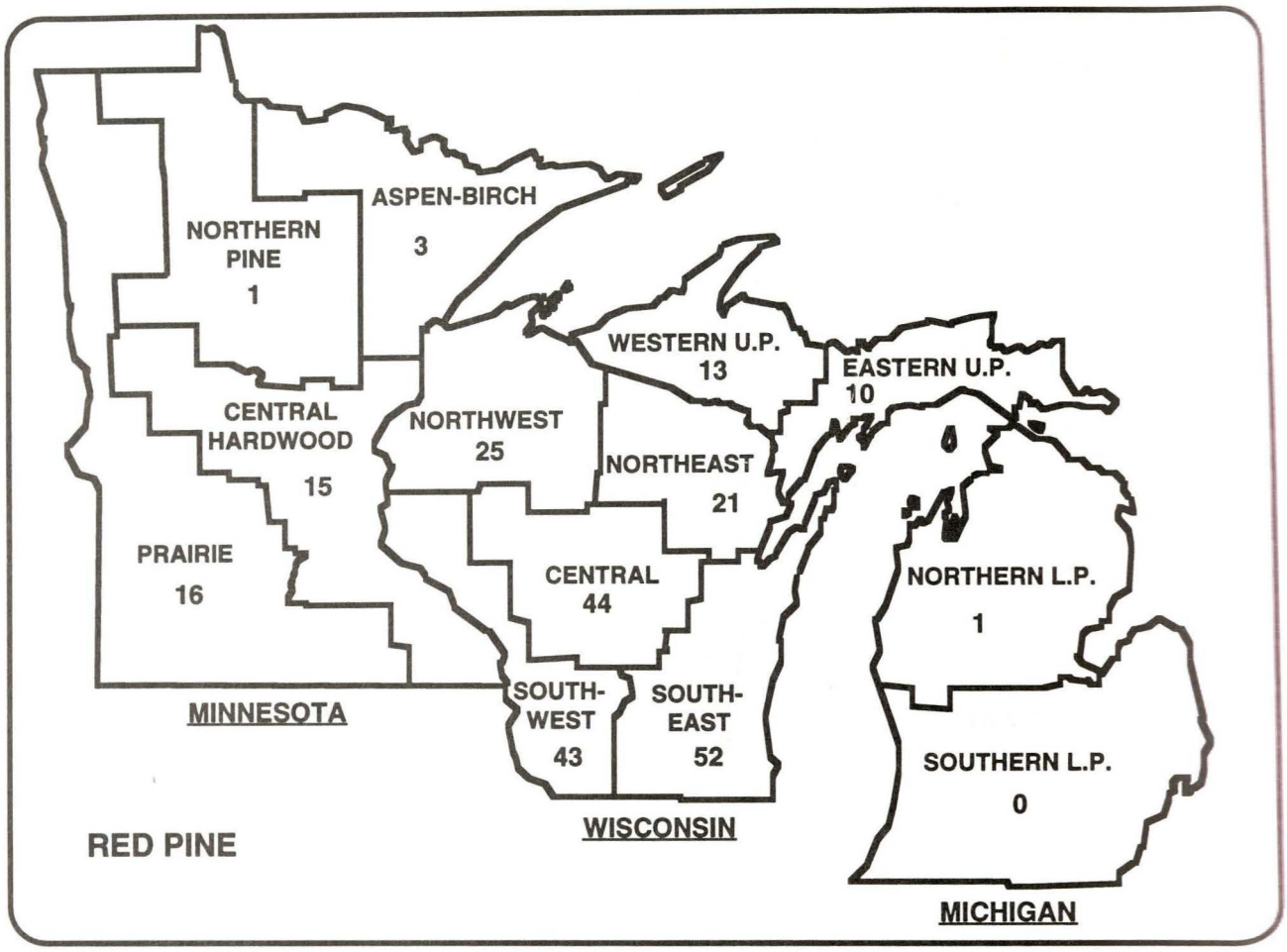
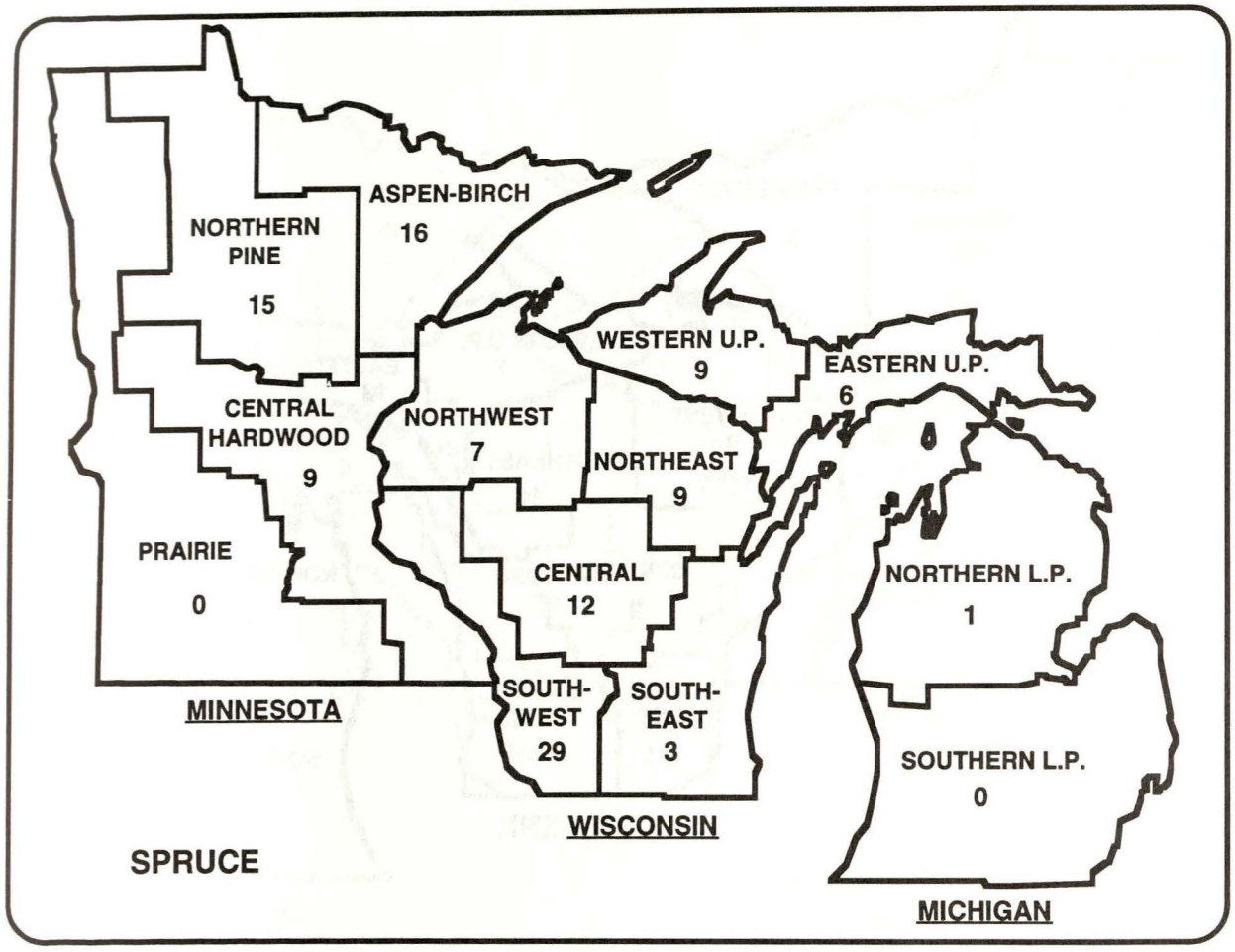
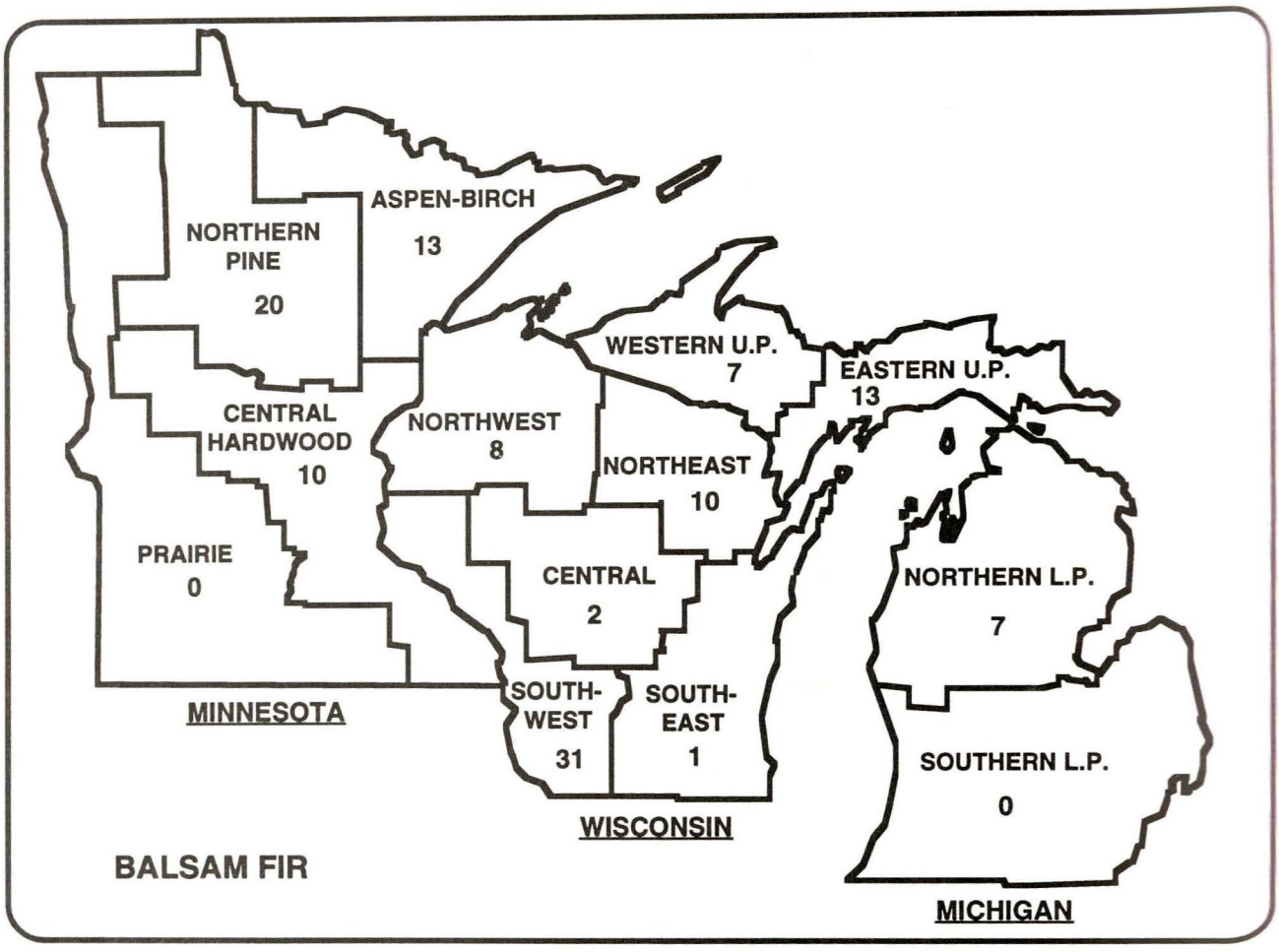
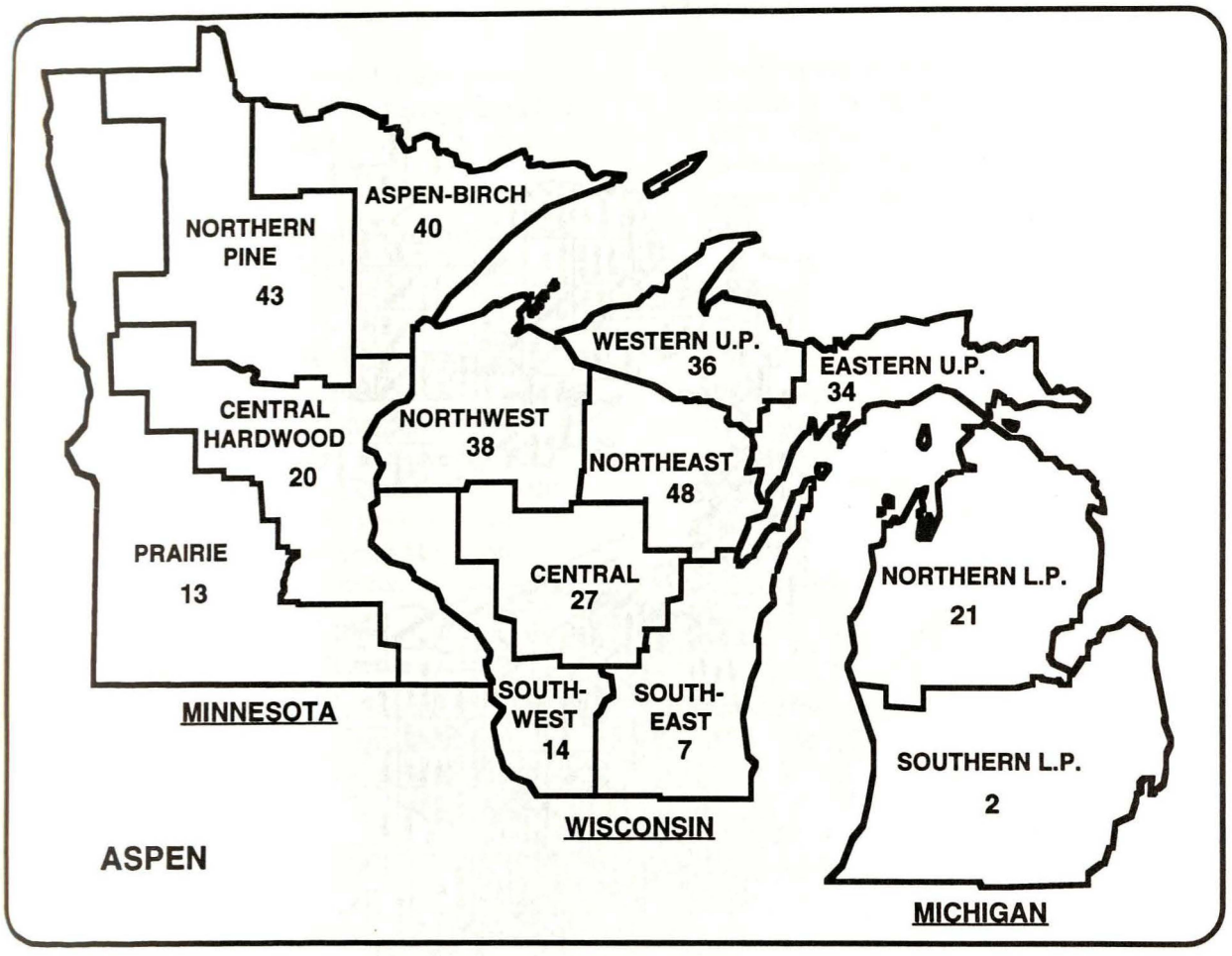


Figure 11.—*Cords of roundwood pulpwood (including chips from roundwood) harvested per 1,000 cords of growing-stock volume for each of the five principal pulpwood species by Forest Survey Unit, 1992. Growing-stock volume was determined during the last forest inventory in each State.*


NORTHERN PINE 1
ASPEN-BIRCH 3
CENTRAL HARDWOOD 15
PRAIRIE 16
NORTHWEST 25
WESTERN U.P. 13
EASTERN U.P. 10
NORTHEAST 21
CENTRAL 44
SOUTH-WEST 43
SOUTH-EAST 52
NORTHERN L.P. 1
SOUTHERN L.P. 0
MINNESOTA
WISCONSIN
MICHIGAN
RED PINE


ASPEN-BIRCH
16
NORTHERN
PINE
15
CENTRAL
HARDWOOD
9
PRAIRIE
0
MINNESOTA
NORTHWEST
7
WESTERN U.P.
9
EASTERN U.P.
6
NORTHEAST
9
CENTRAL
12
SOUTH-
WEST
29
SOUTH-
EAST
3
WISCONSIN
NORTHERN L.P.
1
SOUTHERN L.P.
0
MICHIGAN
SPRUCE


ASPEN-BIRCH
13
NORTHERN
PINE
20
CENTRAL
HARDWOOD
10
PRAIRIE
0
MINNESOTA
NORTHWEST
8
WESTERN U.P.
7
EASTERN U.P.
13
NORTHEAST
10
CENTRAL
2
SOUTH-
WEST
31
SOUTH-
EAST
1
WISCONSIN
NORTHERN L.P.
7
SOUTHERN L.P.
0
MICHIGAN
BALSAM FIR


ASPEN-BIRCH
40
NORTHERN
PINE
43
WESTERN U.P.
36
EASTERN U.P.
34
CENTRAL
HARDWOOD
20
NORTHWEST
38
NORTHEAST
48
PRAIRIE
13
CENTRAL
27
NORTHERN L.P.
21
SOUTH-
WEST
14
SOUTH-
EAST
7
SOUTHERN L.P.
2
MINNESOTA
WISCONSIN
MICHIGAN
ASPEN

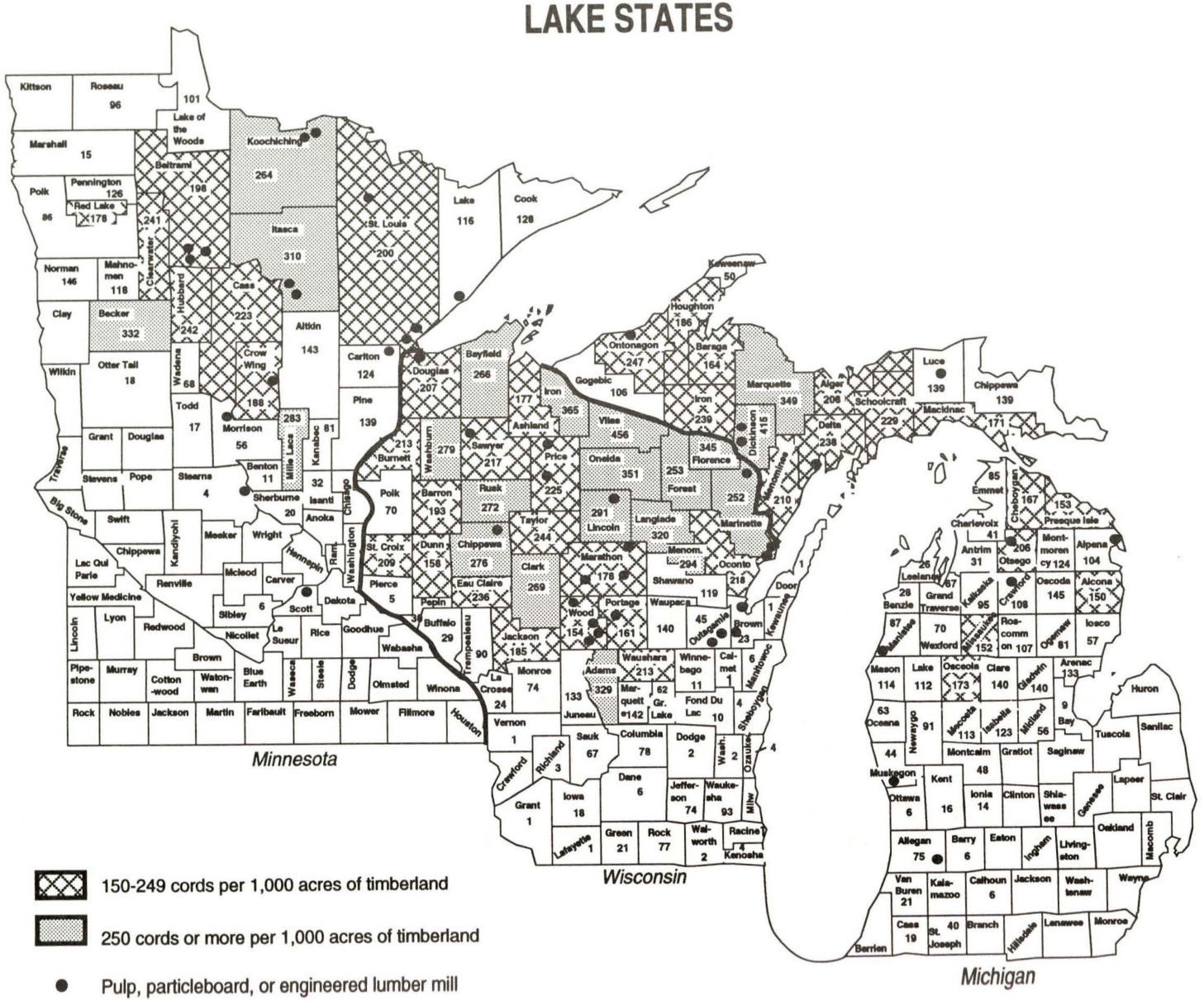


Figure 12.- Cords of pulpwood cut per 1,000 acres of timberland in principal pulpwood-producing counties, 1992. Acres of timberland (stocking of trees greater than 16.7 percent) were determined during the last inventory in each State. Locations of active pulp and particleboard mills are shown.

Receipts

- Thirty-five woodpulp and thirteen particleboard mills in the Lake States acquired 8.9 million cords of pulpwood in 1992, up 3 percent from 1991 (fig. 13).

- In 1992, Wisconsin supplied wood to 25 mills, Michigan supplied 26 mills, and Minnesota supplied 22 mills.

- Softwood residue imported from Canada declined 65 percent in 1992 to 6 thousand cords. Softwood residue imported from States outside the region increased 34 percent to 118 thousand cords. The main suppliers of the softwood residue from outside the Lake States were Montana, South Dakota, and Wyoming.

Michigan

- Eleven Michigan mills consumed 2.8 million cords, down 4 percent from 1991. Wisconsin provided more than 90 percent of the imported wood.

Wisconsin

- The 20 mills in Wisconsin consumed 3.5 million cords, an increase of 21 percent from 1991. Of that total, 537 thousand cords were supplied by out-of-State sources, an increase of 30 percent from the previous year.

Minnesota

- The 17 mills in Minnesota reported consuming an estimated 2.6 million cords, an increase of 8 percent over 1991. Wisconsin supplied 56 thousand cords, Michigan supplied 3 thousand cords, and Canada supplied 28 thousand cords.

Industry Trends and Analysis

Pulp Mills

In this section pulp mills will include wood fiber products such as paper, paperboard, hardboard, insulation board, and medium-density fiber board. All of these products are manufactured from wood that has been reduced to individual fibers, small fiber bundles, or fiber parts that are then formed into a mat.

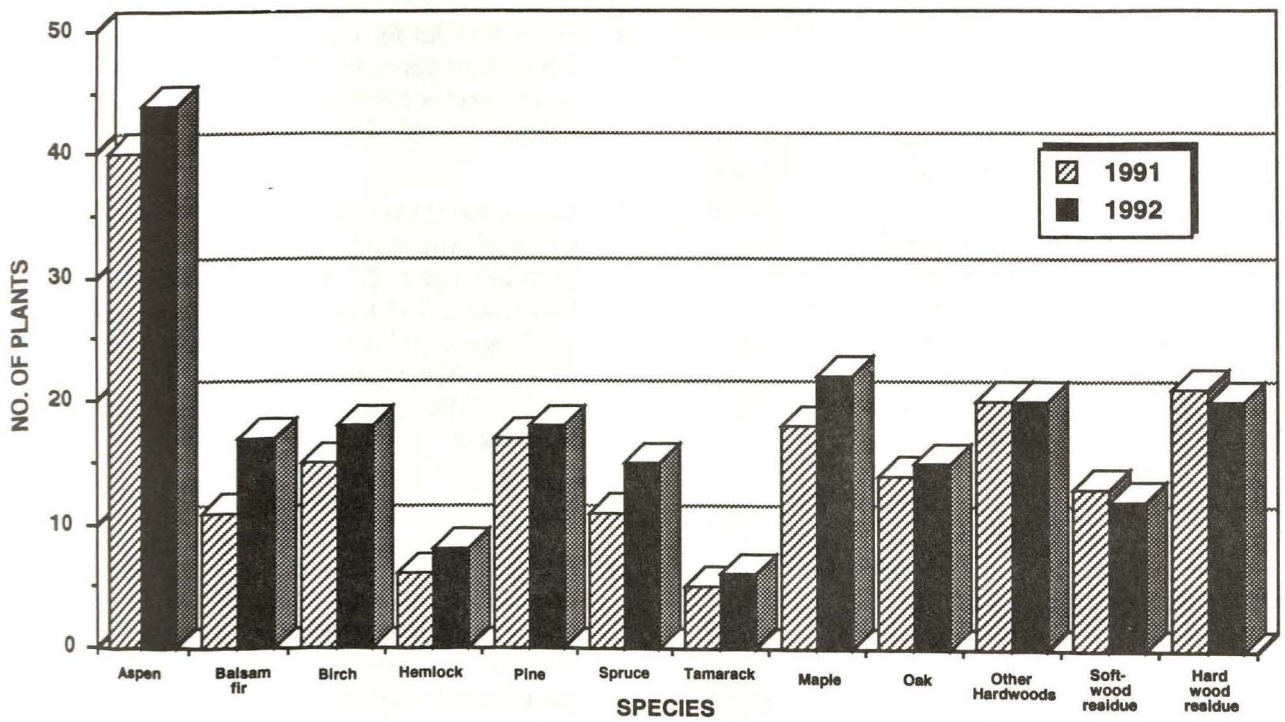


Figure 13.—*Numbers of industrial plants in the Lake States using a particular species or residue for pulping and particleboard, 1991-1992.*

- Of the 8.9 million cords of pulpwood harvested in 1992, 6.4 million cords (72 percent) were used for wood fiber products (pulp). Of each cord used to produce pulp, 91 percent was roundwood and 9 percent was residues.

- Principal species harvested for pulp were aspen (2.2 million cords), jack pine (602 thousand cords), hard maple (536 thousand cords), and white birch (457 thousand cords).

- Aspen and other hardwoods are still the mainstays of the pulp mills in the region, but softwood use has increased steadily since 1988 (fig. 14).

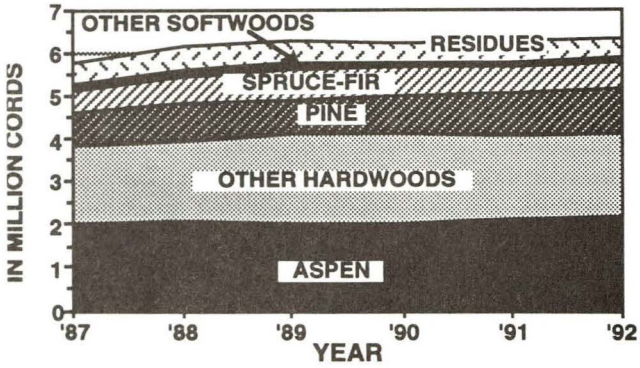


Figure 14.—*Pulpwood production in the Lake States for pulp by species group and residues, 1987-1992.*

- Average daily woodpulp production was 18.4 thousand tons in 1992 (table 3). Kraft mills accounted for 35 percent of the total production, and groundwood and other mechanical process mills accounted for 39 percent. The remaining 26 percent was split between sulphite and semi-chemical process mills.

- Lake States pulpwood production for pulp mills in 1990-1992 was:

Species	Production		
	1990	1991	1992
	(Thousand cords)		
Roundwood			
Aspen	2,029	2,095	2,184
Softwoods	1,677	1,718	1,702
Other species	2,070	1,948	2,041
Residue	450	506	471
Total	6,226	6,267	6,398

Michigan

- Pulpwood production for wood fiber was 2.0 million cords in 1992. Aspen was the major pulpwood species harvested in the State with 527 thousand cords.

- Michigan mills imported 221 thousand cords of pulpwood for processing: 205 thousand cords from Wisconsin and 16 thousand cords from Western States. The State of Michigan exported 18 thousand cords to Canada for wood fiber. Wisconsin received 305 thousand cords and Minnesota received 3 thousand cords in 1992.

Minnesota

- Pulpwood harvested for wood fiber products totaled 1.4 million cords in 1992. Aspen was the predominant species harvested in the State with 835 thousand cords.

- Mills in Minnesota imported 87 thousand cords for pulp products: 3 thousand cords from Michigan, 56 thousand cords from Wisconsin, and 28 thousand cords from Canada. Minnesota exported 79 thousand cords to Wisconsin and 47 thousand cords to Canada.

Wisconsin

- Pulpwood cut for wood fiber products totaled 2.8 million cords in 1992. Aspen was the main species harvested with 823 thousand cords.

- Wisconsin mills imported 490 thousand cords of pulpwood: 305 thousand cords from Michigan, 79 thousand cords from Minnesota, 103 thousand cords from Western States, and 3 thousand cords from Canada. Wisconsin exported 205 thousand cords to Michigan and 56 thousand cords to Minnesota.

Outlook

- A 2-percent increase in market pulpwood production for wood fiber (pulp) mills in the Lake States during 1992 compares favorably with the 11.3-percent rise in U.S. paper and paperboard production.

- Total output in the U.S. paper and paperboard industry for 1992 was 83 million tons (41 million tons of paper and 42 million tons of paperboard). The output of paper and paperboard in the North-Central Region was approximately 5 million tons or 6 percent of the U.S. total in 1992.

- Pulpwood consumption in the U.S. for 1992 totaled 105 million cords, a 7-percent increase from 1991. Pulpwood consumption in the North-Central Region was 6 percent of the U.S. total for 1992.

Particleboard Mills

Particleboard is a generic term for a panel manufactured from lignocellulosic material—commonly wood—in the form of particles (as distinct from fibers). These materials are bonded together with synthetic resin or other suitable binder, under heat and pressure, by a process in which the interparticle bonds are created wholly by the added binder and to which other materials may have been added during manufacture to improve certain properties. The many types of particleboard differ greatly in regard to size and geometry of the particle, the amount of resin (adhesive) used, and the density to which the panel is pressed. The major types of particles used for particleboard are shavings, flakes, wafers, chips, sawdust, strands, slivers, and wood wool (excelsior). Most particleboard in the U.S. is made from residues (shavings, sawdust, or chips), but some types such as waferboard require that roundwood (saw logs or pulpwood) be used. A new product called engineered lumber has been added to this generic term.

- Loggers in the Lake States harvested 2.5 million cords of pulpwood in 1992 for particleboard products. For every cord of pulpwood used in particleboard manufacture, 94 percent came from roundwood and 6 percent was residues from wood-using plants (sawmills, veneer mills, etc.).

- Principal species harvested for particleboard products were aspen (2 million cords), jack pine (130 thousand cords), and balsam poplar (81 thousand cords) (fig. 15).

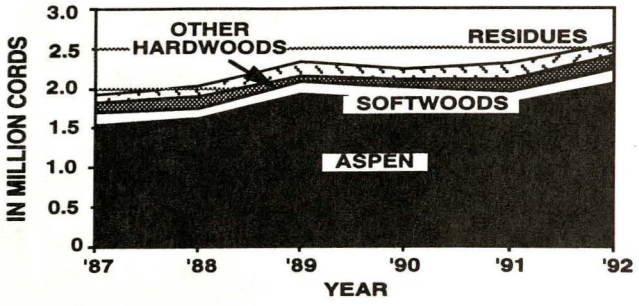


Figure 15.—Pulpwood production for particleboard in the Lake States, 1987-1992.

- Annual production capacity of the Lake States particleboard and engineered lumber product plants is:

Particleboard: Company and product	**Location**	**Production capacity** *(Million square feet 3/4-inch basis)*
Georgia-Pacific - Particleboard	Gaylord, MI	227
Louisiana-Pacific - OSB*	Newberry, MI	55
Louisiana-Pacific - OSB*	Sagola, MI	180
Weyerhaeuser Co. - OSB*	Grayling, MI	180
Louisiana-Pacific - OSB*	Two Harbors, MN	65
Potlatch Corp. - OSB*	Grand Rapids, MN	165
Northwood Panelboard Co. - OSB*	Solway, MN	160
Potlatch Corp. - OSB*	Bemidji, MN	240
Potlatch Corp. - OSB*	Cook, MN	122
Louisiana-Pacific - Waferboard	Hayward, WI	230
Rodman Industries - Particleboard	Marinette, WI	22
Weyerhaeuser Co. - Particleboard	Marshfield, WI	60
Total		1,706

Engineered lumber: Company	**Location**	**Production capacity** *(Thousand cubic feet)*
Trus-Joist McMillian - PSL**	Deerwood, MN	10

* Oriented strand board ** Parallel strand lumber

- Lake States pulpwood production for particleboard mills in 1990-1992 was:

Species	Production		
	1990	1991	1992
	(Thousand cords)		
Roundwood			
Aspen	1,840	1,786	2,050
Softwoods	140	158	157
Other species	103	148	183
Residue	126	194	142
Total	2,209	2,286	2,532

- National housing starts increased 20 percent in 1992 to 1.2 million units. A decrease in the prime interest rate and development of new particleboard-based products accounted for the 11 percent increase in Lakes States pulpwood production for particleboard products.

Michigan

- Pulpwood harvested for particleboard products totaled 854 thousand cords in 1992; aspen made up 507 thousand cords of that total.

- The particleboard mills in Michigan imported 48 thousand cords of aspen and balsam poplar from Wisconsin. Raw materials exported for particleboard production amounted to 18 thousand cords.

Minnesota

- Timber logged for particleboard products totaled 1.2 million cords. The predominant species cut was aspen with 1.1 million cords, or 92 percent of the total.

- The particleboard mills in Minnesota imported 104 cords from Canada. In 1992, raw materials exported from the State for particleboard manufacturing totaled 27 thousand cords.

Wisconsin

- Wisconsin produced 453 thousand cords of wood for particleboard manufacturing. The main species harvested was aspen with 393 thousand cords, or 87 percent of the total.

- The mills in Wisconsin imported 48 thousand cords of both roundwood and residues for particleboard manufacturing: 3 thousand cords of softwood residues from Canada, 18 thousand cords from Michigan, and 27 thousand cords of wood from Minnesota. Wisconsin exported 48 thousand cords to Michigan particleboard mills in 1992.

New Mills and Expansions

Major pulp mill expansion and new construction planned:

- Potlatch Corp., Cloquet, Minnesota, will rebuild a bleached kraft pulp mill, doubling its capacity by 1997.

- Louisiana-Pacific Corp. is building an OSB (oriented strand board) plant in Tomahawk, Wisconsin (scheduled for completion in later 1993 or 1994.

- Appleton Papers Inc., Combined Locks, Wisconsin, expansion is scheduled for completion in 1994.

Idle, Closed, or Converted Mills

Major pulp mills idle, closing, or converting to recycled material:

- James River Corp., Green Bay, Wisconsin, closed sulphite pulp mill only.

CENTRAL STATES

Production

- Pulpwood production in the Central States (Illinois, Indiana, Iowa, and Missouri) increased 5 percent from 339 thousand cords in 1991 to 356 thousand cords in 1992. Hardwood residue from primary wood-using mills made up 73 percent of total production. Softwood roundwood stayed steady at 11 thousand cords in 1992 (fig. 16).

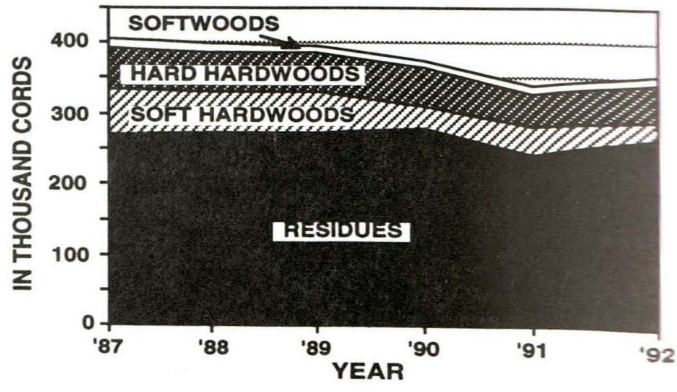


Figure 16.—*Pulpwood production in the Central States, 1987-1992.*

Figure 17.- *Production of pulpwood from roundwood (including chips from roundwood) in the Central States by counties, in standard cords, 1992. Locations of Central States and nearby pulp mills using Central States pulpwood are shown.*

- Pulpwood production from soft hardwood[7] roundwood dropped from 42 thousand cords in 1991 to 26 thousand cords in 1992—a 38 percent decrease. Hard hardwood[8] production, on the other hand, increased from 46 thousand cords in 1991 to 54 thousand cords in 1992—a 17 percent increase. Exports of roundwood and residues from the Central States increased 12 percent to 240 thousand cords. Central States pulpwood was shipped to Kentucky, Wisconsin, Oklahoma, and Michigan mills.

- Loggers harvested pulpwood in 16 counties of Illinois; 15 counties in western and central Indiana; 5 counties in eastern Iowa; and 8 counties in northeast, central, and southeast Missouri (fig. 17).

Illinois

- Illinois produced 77 thousand cords of pulpwood in 1992, 22 percent of the total production in the Central States (fig. 18).

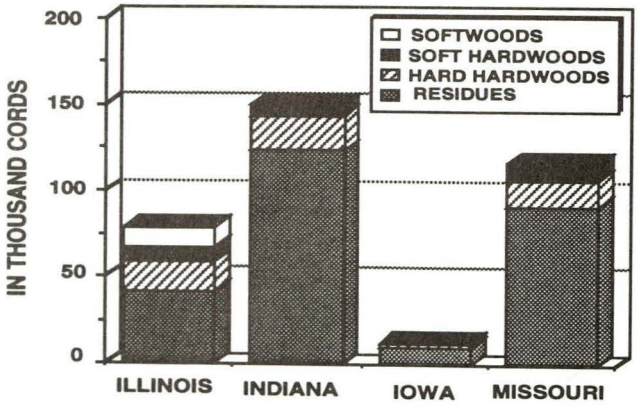


Figure 18.—*Central States pulpwood production by species group, 1992.*

[7] *Hardwood species with an average specific gravity of 0.50 or less.*

[8] *Hardwood species with an average specific gravity greater than 0.50.*

- Illinois does not have any primary woodpulp mills so all pulpwood harvested is shipped to plants outside the State.

Indiana

- Pulpwood production in Indiana accounted for 42 percent of the total pulpwood harvested in the Central States region in 1992, or 150 thousand cords.

- Pulpwood shipped to mills outside the North-Central Region totaled 85 thousand cords, 57 percent of the State's total pulpwood production. The remaining 43 percent was used by mills in the Central and Lakes States regions.

Iowa

- The total pulpwood production in 1992 was 12 thousand cords, 3 percent of the region's total.

Missouri

- Missouri is the second largest producer of pulpwood material in the Central States region at 116 thousand cords or 33 percent of the region's total.

- Missouri exported 94 thousand cords or 81 percent of the State's pulpwood production to mills outside the region, mainly in Kentucky and Oklahoma.

Receipts

- Pulp mills in three Central States received 116 thousand cords in 1992, down 10 percent from 1991.

- Hardwood residue decreased 2 percent, from 85 thousand cords in 1991 to 83 thousand cords in 1992.

- No softwoods were used for pulpwood in the Central States for the ninth consecutive year.

- Average daily pulp production increased in 1992 to 846 tons (table 5).
- Mills in the adjacent States remain the dominant market for Central States pulpwood.
- Hardwood residue from sawmills continues to be the dominant form of pulpwood procured from Central States mills.
- Central States production for roundwood pulpwood was 91 thousand cords in 1992, down 2 percent from 1991.

Conversion Factors Used In The Lake States

Standard cords of green roundwood per green ton:

Species	Factor
Cedar	0.6329
Balsam fir	.4688
Hemlock	.4150
Jack pine	.4688
Red pine	.4688
White pine	.4777
Spruce	.5014
Tamarack	.4291
Ash	.4330
Aspen	.4291
Balsam poplar	.4083
Basswood	.5167
Beech	.3956
White birch	.4018
Yellow birch	.3723
Cottonwood	.4291
Elm	.4018
Hickory	.3701
Hard maple	.3617
Soft maple	.4083
Red oak	.3444
White oak	.3723
Other species	.4688

Table 2.--Numbers of industrial plants in the Lake States using a particular species or residue for pulping or particleboard in 1992

Species and kind of material	Total Lake States	State		
		Michigan	Minnesota	Wisconsin
Ash	17	7	1	9
Aspen	42	10	15	17
Balsam fir	14	2	5	7
Balsam poplar	14	7	6	1
Basswood	13	6	2	5
Beech	7	6	--	1
Cedar	2	2	--	--
Cottonwood	1	--	--	1
Elm	7	2	--	5
Hard maple	18	8	--	10
Hemlock	8	2	--	6
Jack pine	18	3	7	8
Red oak	15	7	--	8
Red pine	15	3	5	7
Soft maple	22	9	2	11
Spruce	12	2	4	6
Tamarack	6	1	--	5
White birch	20	8	3	9
White oak	8	3	--	5
White pine	10	2	1	7
Yellow birch	13	5	--	8
Other hardwoods	11	4	--	7
Hardwood residue	20	7	3	10
Softwood residue	11	2	2	7
Total plants 1/	48	11	16	21

1/ Some plants use more than one species, so numbers in columns are not additive.

Table 3.- -Average daily production of active woodpulp mills in the Lake States and Canada by mill, location, and type of pulp produced, 1992

(In tons per 24 hours)

Company	Location	All types	Type of pulp			
			Sulfite	Kraft	Groundwood and other mechanical	Semi-chemical
Michigan						
ABT Co.	Alpena	400	--	--	400	--
Champion International	Quinnesec	1,000	--	1,000	--	--
Stone Container	Ontonagon	680	--	--	--	680
Mead Corp.	Escanaba	1,500	--	1,250	250	--
Menasha Corp.	Otsego	750	--	--	--	750
Packaging Corp. of America	Filer City	850	--	--	--	850
Warren Co., S.D.	Muskegon	600	--	600	--	--
Total	7 mills	5,780	--	2,850	650	2,280
Minnesota						
Blandin Paper Co.	Grand Rapids	1,400	--	--	1,400	--
Lake Superior Paper Industry	Duluth	600	--	--	600	--
Hennepin Paper Co.	Little Falls	100	--	--	100	--
International Bildrite Inc.	International Falls	110	--	--	110	--
Boise Cascade Corp.	International Falls	1,237	--	1,237	--	--
Potlatch Corp.	Cloquet	520	--	520	--	--
Georgia-Pacific Corp.	Bemidji	100	--	--	100	--
Champion International	Sartell	800	--	--	800	--
Superwood Corp.	Duluth	600	--	--	600	--
Certain-Teed Corp.	Shakopee	80	--	--	80	--
Total	10 mills	5,547	--	1,757	3,790	--
Wisconsin						
James River Corp.	Green Bay	86	86	--	--	--
Weyerhaeuser Co.	Rothschild	140	140	--	--	--
Badger Paper Mills	Peshtigo	101	101	--	--	--
Appleton Papers, Inc.	Combined Locks	550	--	--	550	--
Consolidated Papers, Inc.	Stevens Point	100	--	--	100	--
Consolidated Papers, Inc.	Wisconsin Rapids	1,455	--	900	555	--
Cross Pointe Paper Corp.	Park Falls	375	375	--	--	--
Repap Wisconsin Inc.	Kimberly	120	--	--	120	--
Niagara of Wisconsin Paper.	Niagara	750	--	--	750	--
Mosinee Paper Corp.	Mosinee	200	--	200	--	--
Georgia-Pacific Corp.	Nekoosa	380	--	380	--	--
Georgia-Pacific Corp.	Port Edwards	260	260	--	--	--
Packaging Corp. of America	Tomahawk	1,300	--	--	--	1,300
Globe Building Materials Inc.	Cornell	230	--	--	230	--
Georgia-Pacific Corp.	Superior	250	--	--	250	--
Thilmany Pulp and Paper Co.	Kaukauna	450	--	450	--	--
Wausau Paper Mills Co.	Brokaw	235	235	--	--	--
Georgia-Pacific Corp.	Philips	110	--	--	110	--
Total	18 mills	7,092	1,197	1,930	2,665	1,300
Lake States	35 mills	18,419	1,197	6,537	7,105	3,580
Canada						
Abitibi-Price Inc	Thunder Bay,	390	--	--	390	--
St. Mary's Paper Inc..	Sault Ste. Marie	430	--	--	430	--
Canadian Pacific Forest Prod.	Thunder Bay	1,200	--	1,200	--	--
Total	3 mills	2,020	--	1,200	820	--
Lake States and Canada	38 mills	20,439	1,197	7,737	7,925	3,580

Table 4.--Production and imports of pulpwood, Central States, 1992

(In standard cords, unpeeled) 1/

Species group and destination	Production by State 2/				Regional total	Imports			Total receipts
	Illinois	Indiana	Iowa	Missouri		Lake States	Other U.S.	Total imports	
Softwoods									
Lake States	223	--	--	--	223	--	--	--	-
Northeastern States	10,466	290	--	280	11,036	--	--	--	-
Total	10,689	290	--	280	11,259	--	--	--	-
Soft hardwoods 3/									
Central States 4/	6,647	5,954	1,751	8,201	22,553	--	--	--	22,553
Northeastern States	2,075	--	--	1,622	3,697	--	--	--	-
Total	8,722	5,954	1,751	9,823	26,250	--	--	--	22,553
Hard hardwoods 5/									
Central States 4/	1,363	4,765	1,493	2,754	10,375	--	--	--	10,375
Northeastern States	15,930	15,141	--	12,466	43,537	--	--	--	-
Total	17,293	19,906	1,493	15,220	53,912	--	--	--	10,375
Total roundwood									
Central States 4/	8,010	10,719	3,244	10,955	32,928	--	--	--	32,928
Lake States	223	--	--	--	223	--	--	--	-
Northeastern States	28,471	15,431	--	14,368	58,270	--	--	--	-
Total	36,704	26,150	3,244	25,323	91,421	--	--	--	32,928
Residues, softwoods									
Northeastern States	--	--	--	3,460	3,460	--	--	--	-
Total	--	--	--	3,460	3,460	--	--	--	-
Residues, hardwoods									
Central States 4/	24,844	38,284	9,090	10,628	82,846	--	--	--	82,846
Lake States	--	15,672	--	--	15,672	--	--	--	-
Northeastern States	15,921	69,425	--	76,496	161,842	--	--	--	-
Southern States	--	--	--	373	373	--	--	--	-
Total	40,765	123,381	9,090	87,497	260,733	--	--	--	82,846
Total residues									
Central States 4/	24,844	38,284	9,090	10,628	82,846	--	--	--	82,846
Lake States	--	15,672	--	--	15,672	--	--	--	-
Northeastern States	15,921	69,425	--	79,956	165,302	--	--	--	-
Southern States	--	--	--	373	373	--	--	--	-
Total	40,765	123,381	9,090	90,957	264,193	--	--	--	82,846
All wood material									
Central States 4/	32,854	49,003	12,334	21,583	115,774	--	--	--	115,774
Lake States	223	15,672	--	--	15,895	--	--	--	-
Northeastern States	44,392	84,856	--	94,324	223,572	--	--	--	-
Southern States	--	--	--	373	373	--	--	--	-
Total	77,469	149,531	12,334	116,280	355,614	--	--	--	115,774

1/ Factors used in converting to standard green cords (128 cu. ft. including bark and air space) were:
4,266 pounds of softwood roundwood;
4,795 pounds of soft hardwood roundwood;
5,394 pounds of hard hardwood roundwood;
4,100 pounds of softwood chips (green mill residue);
4,400 pounds of hardwood chips (green mill residue);
2,500 pounds of chips (all species, dry mill residue).

2/ Vertical columns of figures under box heading "Production by State" present the amount of pulpwood cut in each State.

3/ Hardwood species with an average specific gravity of 0.50 or less.

4/ Combined to prevent disclosure of individual mill receipts.

5/ Hardwood species with an average specific gravity greater than 0.50.

Table 5.--Average daily production of active woodpulp mills in the Central States by mill, location, and type of pulp produced, 1992

(In tons per 24 hours)

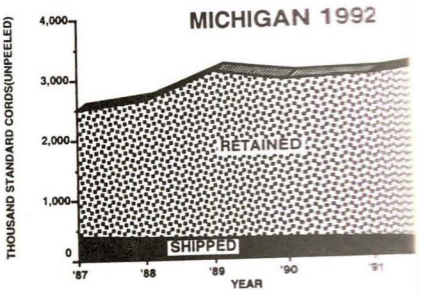
State and company	Location	All types	Type of pulp			
			Sulphite	Kraft	Groundwood and other mechanical	Semi-chemical
Illinois						
(No current operations)						
Total	0 mill	--	--	--	--	--
Indiana						
Weston Paper and Mfg. Co.	Terre Haute	566	--	--	--	566
Total	1 mill	566	--	--	--	566
Iowa						
Consolidated Packaging Corp.	Fort Madison	200	--	200	--	--
Total	1 mill	200	--	200	--	--
Missouri						
Huebert Fibreboard, Inc.	Booneville	80	--	--	80	--
Total	1 mill	80	--	--	80	--
All States	3 mills	846	--	200	80	566

Table 6.--Lake States pulpwood production by State of origin and destination, 1988-1992

(In thousand standard cords, unpeeled)1/

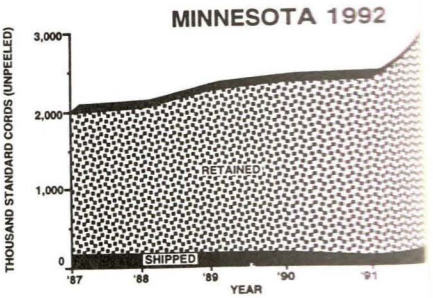
MICHIGAN

Year	Total production	Destination of pulpwood			
		Minnesota	Wisconsin	Michigan	Other
1988	2,920	(2)	311	2,597	12
1989	3,112	(2)	319	2,777	16
1990	2,982	1	313	2,645	23
1991	3,016	5	304	2,687	20
1992	2,877	3	323	2,533	18
5-year average	2,982	2	314	2,648	18



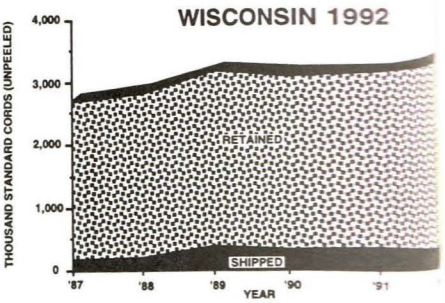
MINNESOTA

Year	Total production	Destination of pulpwood			
		Minnesota	Wisconsin	Michigan	Other
1988	2,131	2,002	79	2	48
1989	2,263	2,110	116	2	34
1990	2,361	2,200	127	1	33
1991	2,391	2,269	101	--	21
1992	2,672	2,520	105	--	47
5-year average	2,364	2,220	106	1	37



WISCONSIN

Year	Total production	Destination of pulpwood			
		Minnesota	Wisconsin	Michigan	Other
1988	3,084	80	2,771	233	(2)
1989	3,161	89	2,799	272	1
1990	3,094	83	2,768	243	--
1991	3,146	69	2,799	274	4
1992	3,296	56	2,987	253	--
5-year average	3,156	75	2,825	255	1



1. Includes mill residues used for pulp.
2. Less than 500 cords.

Table 7.--Lake States pulpwood production by Forest Survey Unit and and destination by State, 1992

(In thousand standard cords, unpeeled)

Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other
MICHIGAN					
Roundwood					
Eastern Upper Peninsula	721	628	1	80	12
Western Upper Peninsula	1,102	859	3	235	5
Northern Lower Peninsula	788	786	--	--	2
Southern Lower Peninsula	39	39	--	--	--
Total	2,650	2,312	4	315	19
Residues	228	220	--	8	--
Total pulpwood	2,878	2,532	4	323	19
MINNESOTA					
Roundwood					
Aspen-Birch	1,128	--	1,031	51	46
Northern Pine	1,299	--	1,281	18	--
Central Hardwood	137	--	102	35	--
Prairie	20	--	20	--	--
Total	2,584	--	2,434	104	46
Residues	87	--	85	1	1
Total pulpwood	2,671	--	2,519	105	47
WISCONSIN					
Roundwood					
Northeast	1,117	201	1	915	--
Northwest	1,201	22	50	1,129	--
Central	574	--	--	574	--
Southeast	35	4	--	31	--
Southwest	81	--	--	81	--
Total	3,008	227	51	2,730	--
Residues	298	26	5	267	--
Total pulpwood	3,306	253	56	2,997	--

Table 8.--Lake States annual pulpwood production from roundwood by species, State, and Forest Survey Unit, 1988-1992

(In thousand standard cords, unpeeled)

Unit	All species1/					Pine					Spruce				
	1988	1989	1990	1991	1992	1988	1989	1990	1991	1992	1988	1989	1990	1991	1992
MICHIGAN															
Eastern Upper Peninsula	758	768	747	760	720	93	53	99	109	129	53	66	29	22	26
Western Upper Peninsula	911	1,044	989	1,045	1,101	82	70	87	88	124	39	48	36	40	43
Northern Lower Peninsula	946	986	935	923	788	123	131	113	112	111	1	1	1	1	1
Southern Lower Peninsula	59	54	46	35	39	(2/)	(2/)	(2/)	(2/)	(2/)	--	--	--	--	--
Total	2,674	2,852	2,717	2,763	2,648	298	254	299	309	364	93	115	66	63	70
MINNESOTA															
Aspen-Birch	922	986	1,014	979	1,129	72	66	58	55	49	114	130	137	110	115
Northern Pine	997	1,106	1,152	1,209	1,299	47	63	76	98	68	32	33	43	31	30
Central Hardwood	94	89	106	106	136	2	3	4	10	14	(2/)	(2/)	(2/)	(2/)	1
Prairie	4	3	4	12	20	--	(2/)	(2/)	--	(2/)	--	--	--	--	--
Total	2,017	2,184	2,276	2,306	2,584	121	132	138	163	131	146	163	180	141	146
WISCONSIN															
Northeast	1,112	1,090	1,075	1,055	1,117	170	149	152	145	141	26	27	32	17	18
Northwest	1,078	1,139	1,127	1,097	1,201	114	120	162	211	203	15	16	15	15	20
Central	552	586	595	549	574	250	246	262	277	276	2	2	1	1	2
Southwest	32	38	53	63	81	28	25	34	50	47	(2/)	(2/)	(2/)	(2/)	1
Southeast	20	16	16	20	26	12	10	10	13	16	(2/)	(2/)	(2/)	(2/)	1
Total	2,794	2,869	2,866	2,784	2,999	574	550	620	696	683	43	45	48	33	42
Total Lake States	7,485	7,905	7,859	7,853	8,231	993	936	1,057	1,168	1,178	282	323	294	237	258

1/ Includes a small quantity of cedar not shown elsewhere in the table.

2/ Less than 500 cords.

(Table 8 continued on next page)

(Table 8 continued)

MICHIGAN

Unit	Balsam fir					Hemlock					Tamarack				
	1988	1989	1990	1991	1992	1988	1989	1990	1991	1992	1988	1989	1990	1991	1992
Eastern Upper Peninsula	75	88	51	63	44	20	23	31	28	18	3	4	5	5	4
Western Upper Peninsula	39	51	33	37	36	15	19	24	20	18	2	2	3	4	3
Northern Lower Peninsula	4	4	2	3	3	(2/)	(2/)	1	(2/)	(2/)	--	--	--	--	--
Southern Lower Peninsula	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	118	143	86	103	83	35	42	56	48	36	5	6	8	9	7

MINNESOTA

Aspen-Birch	102	118	117	106	104	--	--	--	--	--	9	2	2	3	1
Northern Pine	68	80	80	90	81	--	--	--	--	--	2	3	2	1	1
Central Hardwood	1	1	(2/)	(2/)	2	--	--	--	--	--	--	--	--	(2/)	--
Prairie	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	171	199	197	196	187	--	--	--	--	--	11	5	4	4	2

WISCONSIN

Northeast	39	38	37	31	29	40	36	32	26	22	1	2	4	3	2
Northwest	31	28	27	33	32	4	5	4	5	5	2	2	4	3	2
Central	1	1	1	(2/)	(2/)	2	2	2	2	2	1	1	1	(2/)	(2/)
Southwest	(2/)	--	(2/)	--	(2/)	(2/)	--	(2/)	--	(2/)	--	--	--	--	(2/)
Southeast	(2/)	--	(2/)	(2/)	(2/)	(2/)	--	(2/)	(2/)	(2/)	--	--	--	--	--
Total	71	67	66	64	61	46	43	38	33	29	4	5	9	6	5
Total Lake States	360	409	349	363	331	81	85	94	81	65	20	16	21	19	14

2/ Less than 500 cords.

(Table 8 continued on next page)

(Table 8 continued)

MICHIGAN

Unit	Aspen					Birch					Other hardwoods				
	1988	1989	1990	1991	1992	1988	1989	1990	1991	1992	1988	1989	1990	1991	1992
Eastern Upper Peninsula	135	171	220	210	200	106	107	82	66	61	253	233	226	257	238
Western Upper Peninsula	293	364	369	368	367	115	120	103	82	86	316	357	333	406	424
Northern Lower Peninsula	562	553	515	510	460	38	52	43	41	35	218	245	259	256	178
Southern Lower Peninsula	19	16	12	6	7	(2/)	(2/)	(2/)	(2/)	(2/)	40	38	34	29	32
Total	1,009	1,104	1,116	1,094	1,034	259	279	228	189	182	827	873	852	948	872

MINNESOTA

Aspen-Birch	581	616	632	643	782	10	21	21	10	18	34	34	44	52	60
Northern Pine	830	909	928	959	1,073	2	2	1	2	6	16	17	22	28	125
Central Hardwood	86	81	94	84	110	1	1	1	1	1	4	4	7	11	8
Prairie	4	3	4	12	20	--	--	--	--	--	--	--	--	--	--
Total	1,501	1,609	1,658	1,698	1,985	13	24	23	13	25	54	55	73	91	193

WISCONSIN

Northeast	418	437	409	414	452	151	146	136	137	147	267	254	272	282	306
Northwest	573	573	520	513	554	139	151	149	107	134	200	243	246	210	251
Central	176	184	151	149	175	23	35	45	27	25	97	113	134	93	94
Southwest	3	12	14	11	29	(2/)	1	1	1	1	1	1	4	1	3
Southeast	1	2	2	3	6	1	(2/)	(2/)	(2/)	(2/)	6	4	3	4	3
Total	1,171	1,208	1,096	1,090	1,216	314	333	331	272	307	571	615	659	590	657
Total Lake States	3,681	3,921	3,870	3,882	4,235	586	636	582	474	514	1,452	1,543	1,584	1,629	1,722

2/Less than 500 cords.

Table 9.--Michigan pulpwood production from roundwood by county and species group, 1992

(In standard cords, unpeeled)

Unit and county 1/	All species	Species group										
		Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tama-rack	Ash	Aspen	Balsam poplar
E. UPPER PENINSULA												
Alger	98,199	609	6,815	3,164	10,057	3,975	1,324	1,913	582	818	16,495	3,704
Chippewa	97,567	374	4,779	2,090	19,626	2,816	883	3,439	366	240	35,538	9,717
Delta	141,829	619	7,414	3,623	18,136	4,568	1,359	4,220	660	875	41,865	4,366
Luce	64,252	286	4,008	1,572	9,265	1,883	627	2,724	276	317	17,441	5,824
Mackinac	88,516	288	4,864	1,534	6,243	1,891	715	4,707	259	434	25,531	9,165
Menominee	110,065	345	5,250	1,922	7,344	3,025	768	4,372	542	828	41,364	3,360
Schoolcraft	119,975	932	10,712	4,515	24,952	6,981	2,054	4,395	970	649	21,647	3,592
Total	720,404	3,453	43,843	18,420	95,622	25,139	7,730	25,770	3,655	4,162	199,881	39,729
W. UPPER PENINSULA												
Baraga	79,896	116	1,389	710	6,032	1,082	259	973	128	1,496	27,433	2,442
Dickinson	165,224	637	7,748	3,488	15,810	6,627	1,433	7,035	851	604	74,793	4,908
Gogebic	64,791	--	1,045	735	1,239	925	58	1,207	36	1,148	20,309	757
Houghton	98,445	109	2,887	853	7,366	1,686	241	3,625	199	968	25,380	3,933
Iron	157,561	85	4,362	959	3,980	1,421	332	10,192	237	1,524	45,704	3,687
Keweenaw	9,988	--	10	--	52	2,290	207	240	--	74	1,679	--
Marquette	350,780	1,540	17,802	11,121	55,615	10,271	3,380	17,203	1,877	2,216	85,767	11,473
Ontonagon	174,538	--	1,001	478	3,400	933	--	2,881	64	5,813	85,653	5,223
Total	1,101,223	2,487	36,244	18,344	93,493	25,235	5,911	43,357	3,391	13,844	366,719	32,424
N. LOWER PENINSULA												
Alcona	48,162	8	60	1	3,727	256	36	15	--	999	32,478	1,060
Alpena	24,301	--	--	--	260	48	--	--	--	421	18,530	640
Antrim	5,944	--	--	--	674	252	4	--	--	57	3,867	9
Arenac	16,124	--	--	--	175	79	--	--	--	495	11,463	77
Bay	399	--	--	--	--	--	--	--	--	--	124	--
Benzie	3,803	--	--	--	--	--	--	--	--	32	2,787	--
Charlevoix	6,952	--	--	--	42	76	--	--	--	87	1,951	--
Cheboygan	56,791	85	1,218	8	6,686	859	57	553	--	431	31,041	200
Clare	34,451	--	--	--	1,508	160	7	--	--	152	24,520	--
Crawford	31,236	--	--	--	14,193	337	127	--	--	36	9,655	--
Emmet	16,748	43	343	4	95	156	--	83	--	65	8,862	--
Gladwin	26,112	--	--	--	547	23	--	--	--	13	21,326	5
Grand Traverse	11,455	--	--	--	2,058	1,209	--	--	--	71	4,639	19
Iosco	13,784	--	--	--	289	611	--	--	--	195	9,530	126
Isabella	12,535	--	--	--	394	237	--	--	--	--	10,764	--
Kalkaska	25,314	--	--	--	8,461	1,904	80	--	--	33	10,403	--
Lake	35,435	--	--	--	3,788	11	--	--	--	264	18,703	--
Leelanau	2,255	--	--	--	--	--	--	--	--	--	1,229	--
Manistee	21,674	--	--	--	22	268	--	--	--	264	8,953	--
Mason	17,878	--	--	--	22	43	--	--	--	118	12,465	--
Mecosta	18,405	--	--	--	37	42	--	--	--	476	14,055	--
Midland	9,895	--	--	--	--	--	--	--	--	59	8,359	10
Missaukee	34,876	--	--	--	822	1,434	--	--	--	205	23,623	--
Montmorency	36,470	3	26	--	4,344	388	37	6	--	509	23,538	200
Newaygo	29,937	--	--	--	133	44	--	--	--	189	20,928	--
Oceana	11,463	--	--	--	--	--	--	--	--	74	7,170	--
Ogemaw	18,464	--	--	--	747	10	--	--	--	191	11,834	173
Osceola	32,152	--	--	--	46	183	--	--	--	393	23,653	--
Oscoda	44,515	--	--	--	25,032	1,563	160	--	--	336	12,158	248
Otsego	49,342	--	--	--	9,871	786	68	--	--	415	19,927	80
Presque Isle	45,795	58	959	5	5,642	59	51	477	--	869	24,541	790
Roscommon	27,377	--	--	--	6,408	350	5	--	--	51	15,815	31
Wexford	18,240	--	--	--	712	1,403	--	--	--	123	11,062	--
Total	788,281	197	2,606	19	96,734	12,787	632	1,134	--	7,623	459,952	3,671

(Table 9 continued on next page)

(Table 9 continued)

Unit and county 1/	All species	Species group: Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Bals pop
S. LOWER PENINSULA												
Allegan	13,368	--	--	--	--	--	--	--	--	--	2,104	
Barry	721	--	--	--	--	--	--	--	--	--	656	
Calhoun	667	--	--	--	--	--	--	--	--	--	--	
Cass	1,462	--	--	--	--	--	--	--	--	--	--	
Gratiot	21	--	--	--	--	--	--	--	--	--	21	
Ionia	1,051	--	--	--	--	--	--	--	--	106	2	
Kent	2,511	--	--	--	--	--	--	--	--	1	171	
Lenawee	273	--	--	--	--	--	--	--	--	--	100	
Montcalm	6,339	--	--	--	61	61	--	--	--	166	1,903	
Muskegon	6,966	--	--	--	--	--	--	--	--	43	1,367	
Ottawa	506	--	--	--	--	--	--	--	--	--	231	
St. Joseph	2,623	--	--	--	--	--	--	--	--	--	--	
Van Buren	2,623	--	--	--	--	--	--	--	--	--	--	
Total	39,131	--	--	--	61	61	--	--	--	316	6,555	
State total	2,649,039	6,137	82,693	36,783	285,910	63,222	14,274	70,260	7,046	25,944	1,033,106	75,8

1/ Includes only those counties that supplied pulpwood in 1992.

(Table 9 continued on next pag

Table may not add to totals due to rounding in data base.

(Table 9 continued)

MICHIGAN

Unit and county 1/	Species group											
	Bass-wood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwood
E. UPPER PENINSULA												
Alger	1,251	3,278	5,187	2,074	--	156	--	20,963	12,813	688	--	2,328
Chippewa	480	1,094	3,044	655	--	27	--	5,469	6,063	147	--	721
Delta	1,254	3,164	11,033	1,249	--	169	--	21,345	12,897	754	20	2,241
Luce	451	914	4,006	407	--	78	--	8,426	4,762	351	--	634
Mackinac	689	1,746	9,508	1,087	--	70	--	10,640	7,692	308	--	1,146
Menominee	803	1,788	15,752	1,089	--	118	--	10,849	8,532	691	36	1,288
Schoolcraft	979	2,801	4,673	1,722	--	103	--	15,797	10,029	461	11	2,000
Total	5,908	14,786	53,203	8,283	--	720	--	93,488	62,788	3,399	68	10,358
W. UPPER PENINSULA												
Baraga	1,879	915	5,067	1,793	2	93	--	18,326	7,954	1,024	14	770
Dickinson	781	2,052	13,955	1,282	--	97	--	13,064	8,111	454	31	1,464
Gogebic	1,281	1,173	1,081	876	17	1,064	--	19,567	10,187	1,113	93	880
Houghton	1,291	2,211	4,677	2,466	2	152	--	24,970	12,621	1,006	35	1,766
Iron	1,839	2,794	16,011	1,756	2	377	--	38,507	19,813	1,889	91	1,999
Keweenaw	98	148	185	234	--	21	--	3,082	1,401	133	--	134
Marquette	2,963	7,194	25,969	4,315	--	421	--	53,179	31,215	2,009	104	5,146
Ontonagon	8,007	1,007	4,268	2,544	40	150	--	35,824	13,713	2,814	34	689
Total	18,139	17,494	71,213	15,266	63	2,375	--	206,518	105,014	10,441	402	12,849
N. LOWER PENINSULA												
Alcona	97	155	3,978	--	--	--	--	391	4,374	528	--	--
Alpena	29	70	2,144	7	--	--	--	185	1,957	--	--	11
Antrim	59	91	161	8	--	--	--	263	490	--	--	8
Arenac	7	67	565	43	--	--	--	468	1,872	502	257	54
Bay	--	--	--	--	--	--	--	275	--	--	--	--
Benzie	82	48	156	6	--	--	--	189	408	50	12	34
Charlevoix	223	122	779	--	--	--	--	1,224	2,443	4	--	--
Cheboygan	454	270	3,736	--	--	--	--	1,997	7,830	1,368	--	--
Clare	--	140	203	61	--	--	--	919	3,288	2,461	796	237
Crawford	130	66	1,004	--	--	--	--	708	2,281	2,660	38	--
Emmet	233	119	1,555	--	--	--	--	1,501	3,689	--	--	--
Gladwin	48	25	634	--	--	--	--	456	2,944	44	47	--
Grand Traverse	107	99	214	17	--	--	--	602	1,123	697	386	215
Iosco	16	29	960	--	--	--	--	69	1,949	8	1	0
Isabella	--	--	72	--	--	--	--	--	1,067	--	--	--
Kalkaska	64	47	527	19	--	--	--	1,173	2,118	275	186	24
Lake	215	243	204	45	--	--	--	1,031	2,814	4,817	2,993	306
Leelanau	227	167	325	--	--	--	--	73	89	70	76	--
Manistee	981	697	301	4	--	--	--	2,498	2,980	1,709	1,711	1,287
Mason	113	151	515	30	--	--	--	419	1,380	1,277	1,067	279
Mecosta	--	15	344	46	--	--	--	552	1,416	864	511	48
Midland	--	33	233	15	--	--	--	82	741	206	135	22
Missaukee	323	30	319	14	--	--	--	2,090	4,037	1,023	787	169
Montmorency	117	111	2,473	--	--	--	--	433	2,943	1,342	--	--
Newaygo	--	160	112	101	--	--	--	615	2,718	2,907	1,898	134
Oceana	--	38	45	24	--	--	--	112	754	1,650	1,526	68
Ogemaw	110	54	1,448	--	--	--	--	338	1,741	1,700	83	35
Osceola	174	209	701	104	--	--	--	1,575	3,406	1,122	416	170
Oscoda	23	53	892	--	--	--	--	353	1,962	1,736	--	--
Otsego	564	586	2,426	--	--	--	--	4,674	9,944	--	--	--
Presque Isle	173	273	6,600	--	--	--	--	437	4,531	330	--	--
Roscommon	4	8	509	2	--	--	--	210	2,783	649	548	2
Wexford	465	230	88	24	--	--	--	781	1,961	861	275	255
Total	5,039	4,405	34,222	570	--	--	--	26,692	84,033	30,860	13,749	3,358

(Table 9 continued on next page)

(Table 9 continued)

Unit and county 1/	Species group											
	Bass-wood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwood
S. LOWER PENINSULA												
Allegan	--	--	--	--	--	--	--	--	3,084	3,931	4,249	-
Barry	--	--	2	--	--	--	--	--	63	--	--	-
Calhoun	--	--	--	--	--	--	--	--	22	310	335	-
Cass	--	--	--	--	--	--	--	--	29	689	745	-
Gratiot	--	--	--	--	--	--	--	--	--	--	--	-
Ionia	--	67	--	--	--	--	--	168	188	314	116	9
Kent	--	--	2	--	--	--	--	2	951	743	640	
Lenawee	--	--	--	--	--	--	--	173	--	--	--	-
Montcalm	--	85	10	8	--	--	--	329	508	1,779	1,358	7
Muskegon	--	41	7	6	--	--	--	29	331	2,665	2,471	5
Ottawa	--	--	5	--	--	--	--	--	55	103	112	-
St. Joseph	--	--	--	--	--	--	--	--	845	1,033	745	-
Van Buren	--	--	--	--	--	--	--	--	845	1,033	745	-
Total	--	193	26	14	--	--	--	701	6,920	12,601	11,515	168
State total	29,086	36,878	158,664	24,134	63	3,095	--	327,400	258,755	57,301	25,733	26,733

1/ Includes only those counties that supplied pulpwood in 1992.
Table may not add to totals due to rounding in data base.

Table 10.--Minnesota pulpwood production from roundwood by county and species group, 1992

(In standard cords, unpeeled)

Unit and county 1/	All species	Species group: Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
ASPEN-BIRCH												
Carlton	42,250	--	9,735	--	1,032	174	--	2,007	54	218	21,641	163
Cook	72,330	--	5,408	--	52	--	--	11,832	15	--	54,119	--
Koochiching	375,814	--	24,996	--	6,521	572	--	48,665	609	--	262,155	32,296
Lake	98,244	--	13,002	--	8,054	4,504	--	14,182	104	--	49,179	1,658
St. Louis	540,358	--	50,735	--	25,113	2,596	--	38,639	109	714	394,868	20,805
Total	1,128,996	--	103,875	--	40,773	7,846	--	115,326	892	931	781,962	54,922
NORTHERN PINE												
Aitkin	101,916	--	5,552	--	755	47	--	841	--	565	89,680	1,021
Becker	110,429	--	731	--	788	292	--	2	--	--	105,656	2,960
Beltrami	166,922	--	11,685	--	7,290	1,070	--	3,373	350	--	140,016	3,139
Cass	187,839	--	5,124	--	8,178	880	--	1,392	--	--	163,484	6,089
Clearwater	69,809	--	2,070	--	1,602	458	--	868	60	--	63,864	888
Crow Wing	72,859	--	545	--	3,217	961	--	38	--	--	68,018	--
Hubbard	96,629	--	491	--	3,211	822	--	213	--	--	89,505	2,368
Itasca	410,621	--	53,059	--	7,683	1,472	--	19,643	--	1,033	307,465	12,193
Lake of the Woods	40,204	--	2,126	--	15,661	58	--	2,803	98	--	18,943	514
Mahnomen	13,390	--	--	--	--	--	--	--	--	--	13,242	148
Roseau	20,759	--	24	--	12,931	29	--	1,142	--	--	6,119	514
Wadena	8,053	--	--	--	624	146	--	--	--	--	7,283	--
Total	1,299,430	--	81,407	--	61,941	6,234	--	30,313	508	1,598	1,073,275	29,833
CENTRAL HARDWOOD												
Benton	392	--	--	--	--	--	--	--	--	--	392	--
Chisago	8	--	--	--	--	--	--	--	--	--	8	--
Isanti	1,739	--	--	--	236	1,185	--	14	--	--	303	--
Kanabec	11,583	--	--	--	31	--	--	--	--	--	11,470	82
Mille Lacs	39,231	--	34	--	4,688	4,688	4,777	14	--	--	25,030	--
Morrison	9,280	--	--	--	--	--	--	22	--	--	9,259	--
Otter Tail	3,836	--	--	--	--	--	--	--	--	--	3,836	--
Pine	67,440	--	1,698	--	1,497	1,462	--	590	--	521	57,376	612
Sherburne	1,014	--	--	--	93	894	6	21	--	--	--	--
Stearns	293	--	--	--	--	--	--	--	--	--	293	--
Todd	1,677	--	--	--	--	--	--	--	--	--	1,677	--
Total	136,493	--	1,732	--	6,546	8,229	4,783	660	--	521	109,643	694
PRAIRIE												
Marshall	1,934	--	--	--	--	--	--	--	--	--	1,934	--
Norman	3,771	--	--	--	--	--	--	--	--	--	3,771	--
Pennington	4,395	--	--	--	--	--	--	--	--	--	4,395	--
Polk	5,007	--	--	--	--	--	--	--	--	--	5,007	--
Red Lake	4,855	--	--	--	--	--	--	--	--	--	4,825	29
Sibley	132	--	--	--	--	132	--	--	--	--	--	--
Total	20,094	--	--	--	--	132	--	--	--	--	19,933	29
State Total	2,585,013	--	187,014	--	109,259	22,441	4,783	146,299	1,400	3,050	1,984,813	85,478

1/ Includes only those counties that supplied pulpwood in 1992.

(Table 10 continued on next page.)

(Table 10 continued)

MINNESOTA

Unit and county 1/	Species group											
	Bass-wood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwood
ASPEN-BIRCH												
Carlton	260	--	6,144	--	--	--	--	--	821	--	--	--
Cook	--	--	904	--	--	--	--	--	--	--	--	--
Koochiching	--	--	--	--	--	--	--	--	--	--	--	--
Lake	16	--	7,547	--	--	--	--	--	--	--	--	--
St. Louis	852	--	3,214	--	--	--	--	--	2,712	--	--	--
Total	1,127	--	17,809	--	--	--	--	--	3,533	--	--	--
NORTHERN PINE												
Aitkin	700	--	576	--	--	--	--	--	2,180	--	--	--
Becker	--	--	--	--	--	--	--	--	--	--	--	--
Beltrami	--	--	--	--	--	--	--	--	--	--	--	--
Cass	--	--	2,691	--	--	--	--	--	--	--	--	--
Clearwater	--	--	--	--	--	--	--	--	--	--	--	--
Crow Wing	--	--	80	--	--	--	--	--	--	--	--	--
Hubbard	--	--	20	--	--	--	--	--	--	--	--	--
Itasca	1,232	--	2,945	--	--	--	--	--	3,896	--	--	--
Lake of the Woods	--	--	--	--	--	--	--	--	--	--	--	--
Mahnomen	--	--	--	--	--	--	--	--	--	--	--	--
Roseau	--	--	--	--	--	--	--	--	--	--	--	--
Wadena	--	--	--	--	--	--	--	--	--	--	--	--
Total	1,932	--	6,312	--	--	--	--	--	6,076	--	--	--
CENTRAL HARDWOOD												
Benton	--	--	--	--	--	--	--	--	--	--	--	--
Chisago	--	--	--	--	--	--	--	--	--	--	--	--
Isanti	--	--	--	--	--	--	--	--	--	--	--	--
Kanabec	--	--	--	--	--	--	--	--	--	--	--	--
Mille Lacs	--	--	--	--	--	--	--	--	--	--	--	--
Morrison	--	--	--	--	--	--	--	--	--	--	--	--
Otter Tail	--	--	--	--	--	--	--	--	--	--	--	--
Pine	622	--	928	--	--	--	--	--	2,135	--	--	--
Sherburne	--	--	--	--	--	--	--	--	--	--	--	--
Stearns	--	--	--	--	--	--	--	--	--	--	--	--
Todd	--	--	--	--	--	--	--	--	--	--	--	--
Total	622	--	928	--	--	--	--	--	2,135	--	--	--
PRAIRIE												
Marshall	--	--	--	--	--	--	--	--	--	--	--	--
Norman	--	--	--	--	--	--	--	--	--	--	--	--
Pennington	--	--	--	--	--	--	--	--	--	--	--	--
Polk	--	--	--	--	--	--	--	--	--	--	--	--
Red Lake	--	--	--	--	--	--	--	--	--	--	--	--
Sibley	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--
State Total	3,681	--	25,050	--	--	--	--	--	11,744	--	--	--

1/ Includes only those counties that supplied pulpwood in 1992.

Table 11.--Wisconsin pulpwood production from roundwood by county and species group, 1992

(In standard cords, unpeeled)

Unit and county 1/	All species	Species group										
		Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
NORTHEAST												
Florence	84,125	--	2,785	3,190	563	2,280	157	2,647	--	1,005	40,449	768
Forest	124,689	--	6,223	1,531	983	5,807	244	4,625	386	5,012	37,617	747
Langlade	119,888	--	3,565	1,000	3,612	3,436	329	1,144	308	4,135	51,872	434
Lincoln	114,427	--	2,074	591	2,825	5,814	465	926	292	3,853	58,035	382
Marinette	161,180	2	4,374	150	22,937	16,232	1,059	2,185	534	1,267	67,541	444
Menominee	62,649	12	200	13,008	2,707	3,343	4,838	57	23	1,756	14,816	296
Oconto	75,733	--	554	125	6,438	12,708	419	103	15	646	33,764	611
Oneida	174,658	--	4,758	684	9,459	10,648	3,350	4,022	468	6,612	60,068	473
Shawano	30,393	--	49	953	259	3,560	104	223	23	659	16,766	235
Vilas	169,373	--	4,251	295	8,419	6,515	2,478	2,041	169	2,918	70,985	914
Total	1,117,115	14	28,832	21,527	58,200	70,342	13,441	17,973	2,219	27,863	451,914	5,305
NORTHWEST												
Ashland	89,245	--	5,306	545	8,776	2,172	1,060	4,695	253	3,628	29,541	14
Barron	30,595	--	13	32	2,731	2,460	163	302	--	486	18,757	2
Bayfield	197,244	--	2,273	66	44,157	7,339	488	1,662	78	2,475	97,182	13
Burnett	67,449	--	78	--	25,672	10,690	13	22	--	271	26,482	--
Douglas	130,285	--	6,892	24	34,893	11,378	109	900	--	847	56,624	--
Iron	137,983	202	7,220	2,157	3,904	2,398	657	5,400	297	3,711	67,574	99
Polk	15,545	--	13	--	2,221	979	--	15	--	148	9,730	--
Price	124,080	--	4,914	987	1,883	5,298	591	3,247	693	4,095	56,182	156
Rusk	98,771	--	265	304	903	1,979	136	754	363	4,880	37,621	45
Sawyer	131,694	--	2,296	298	2,871	3,426	976	1,748	483	6,232	54,612	65
Taylor	86,429	--	2,339	1,016	274	544	--	673	134	2,671	49,834	49
Washburn	91,604	--	317	13	14,565	7,792	224	278	--	2,351	50,308	1
Total	1,200,925	202	31,924	5,441	142,850	56,456	4,418	19,695	2,301	31,795	554,448	443
CENTRAL												
Adams	77,044	--	--	--	39,000	27,116	3,806	23	--	294	1,829	--
Chippewa	62,287	--	46	86	874	2,284	116	141	11	1,963	37,108	19
Clark	85,035	--	--	--	2,840	3,490	470	--	66	2,886	48,999	16
Eau Claire	36,534	--	--	12	10,782	7,874	317	34	--	616	10,845	3
Jackson	68,697	--	12	--	32,732	7,912	1,477	89	42	607	16,544	4
Juneau	33,619	--	--	--	19,715	7,999	932	24	--	273	707	1
Marathon	63,890	--	228	1,137	2,318	5,158	644	895	--	2,212	31,249	34
Marquette	13,381	--	7	--	1,037	9,865	1,807	24	--	57	--	--
Monroe	18,232	--	6	--	8,143	6,678	774	88	--	246	547	--
Portage	28,023	--	11	244	4,908	10,573	1,556	110	29	424	5,849	17
Waupaca	24,132	--	50	486	713	10,456	988	105	--	389	6,759	1
Waushara	30,950	--	--	--	1,631	23,314	3,778	38	--	72	1,334	--
Wood	31,834	--	4	44	4,263	6,269	1,357	49	19	579	13,475	2
Total	573,656	--	364	2,008	128,955	128,988	18,022	1,618	167	10,617	175,246	97
SOUTHWEST												
Buffalo	5,473	--	--	--	121	2,184	267	85	--	24	2,588	--
Crawford	22	--	--	--	--	11	--	--	--	--	--	--
Dunn	26,782	--	25	--	3,241	11,225	416	73	19	295	9,103	1
Grant	167	--	--	--	10	143	--	--	--	--	14	--
Iowa	2,499	--	--	--	142	2,021	336	--	--	--	--	--
La Crosse	2,875	--	--	--	1,143	947	246	100	--	44	23	--
Lafayette	30	--	--	--	12	--	18	--	--	--	--	--
Pepin	1,587	--	26	--	81	744	89	11	--	--	636	--
Pierce	505	--	--	--	79	96	9	22	--	1	292	--
Richland	439	--	--	--	38	200	164	--	--	2	--	--
Sauk	12,136	--	12	7	917	9,059	1,484	184	--	24	9	--
St Croix	15,267	--	14	--	242	1,485	82	86	--	3	13,196	--
Trempealeau	13,226	--	--	--	360	8,532	910	131	--	61	2,676	--
Vernon	245	--	--	--	--	232	13	--	--	--	--	--
Total	81,252	--	77	7	6,386	36,879	4,034	693	19	454	28,537	1

(Table 11 continued on next page)

(Table 11 continued)

Unit and county 1/	All species	Species group										
		Cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tama-rack	Ash	Aspen	Balsam poplar
SOUTHEAST												
Brown	4,660	--	--	--	11	163	--	--	--	19	3,850	411
Columbia	6,552	--	--	--	393	5,132	730	81	--	11	88	-
Dane	568	--	--	--	23	266	93	10	--	19	--	-
Dodge	54	--	--	--	31	23	--	--	--	--	--	-
Door	110	--	--	--	--	26	--	--	--	3	55	-
Fond Du Lac	357	--	--	--	--	296	12	--	--	3	4	-
Green	646	--	--	--	221	325	78	--	--	2	--	-
Green Lake	1,302	--	--	--	34	1,013	174	--	--	5	14	-
Jefferson	2,147	--	--	--	309	1,648	190	--	--	--	--	-
Kenosha	38	--	11	--	13	--	--	--	--	--	14	-
Kewaunee	42	--	--	--	--	34	--	--	--	1	--	-
Manitowoc	330	--	--	9	--	33	3	17	--	27	--	-
Milwaukee	20	--	--	--	--	11	9	--	--	--	--	-
Outagamie	3,187	--	--	--	11	143	10	--	--	115	1,819	-
Ozaukee	69	--	9	--	--	21	38	--	--	--	--	-
Rock	2,066	--	--	--	25	1,877	133	31	--	--	--	-
Sheboygan	227	--	--	--	--	227	--	--	--	--	--	-
Walworth	55	--	--	--	28	15	12	--	--	--	--	-
Washington	69	--	--	--	--	41	13	16	--	--	--	-
Waukesha	2,984	--	--	--	11	1,790	793	390	--	--	--	-
Winnebago	155	--	--	--	--	--	--	--	--	14	28	-
Total	25,636	--	20	9	1,110	13,082	2,288	545	--	219	5,871	411
State total	2,998,584	216	61,217	28,992	337,501	305,747	42,204	40,524	4,706	70,948	1,216,016	6,257

1/ Includes only those counties that supplied pulpwood in 1992.

(Table 11 continued on next page)

(Table 11 continued)

WISCONSIN

Unit and county 1/	Species group											
	Bass-wood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwood
NORTHEAST												
Florence	1,143	618	9,753	423	24	300	--	10,237	6,138	998	208	439
Forest	2,148	494	16,691	1,643	50	3,670	--	18,838	13,566	2,678	1,337	399
Langlade	2,736	271	12,676	1,466	76	2,681	--	15,779	10,242	2,723	964	439
Lincoln	5,345	49	10,789	496	151	1,539	--	8,476	5,328	5,589	389	1,020
Marinette	1,389	1,064	13,899	502	21	181	--	16,133	9,166	1,188	138	772
Menominee	206	130	2,628	882	1	785	--	6,866	7,001	2,606	194	295
Oconto	487	405	7,295	355	6	139	--	6,736	3,985	530	126	286
Oneida	8,848	168	24,840	706	242	399	--	16,680	9,553	9,895	949	1,836
Shawano	162	11	1,540	288	4	150	--	2,297	2,269	690	127	26
Vilas	3,656	451	38,598	893	93	924	--	13,305	8,853	2,465	597	553
Total	26,121	3,661	138,710	7,654	668	10,767	--	115,345	76,100	29,363	5,029	6,065
NORTHWEST												
Ashland	934	11	9,727	839	14	518	--	9,984	7,050	2,693	1,245	242
Barron	175	--	2,246	66	2	44	--	1,157	1,144	630	79	106
Bayfield	1,409	1	24,839	542	13	211	--	5,511	6,323	1,884	523	256
Burnett	33	--	1,891	61	--	9	--	855	1,071	138	44	120
Douglas	824	--	12,192	36	--	8	--	1,071	4,243	165	59	19
Iron	2,836	485	9,476	863	61	1,231	--	14,653	9,139	4,031	727	862
Polk	43	1	546	19	--	4	--	1,229	333	213	13	39
Price	5,682	33	15,373	641	156	1,217	--	9,373	6,999	5,049	553	955
Rusk	2,795	13	15,004	932	45	599	--	14,054	10,155	5,902	944	1,080
Sawyer	2,547	19	22,285	1,865	65	1,613	--	14,272	10,646	3,583	1,254	540
Taylor	2,033	123	5,749	866	49	3,760	--	7,163	6,821	1,756	291	284
Washburn	159	--	7,693	160	1	359	--	2,781	3,656	709	122	114
Total	19,471	686	127,022	6,890	405	9,575	--	82,103	67,580	26,752	5,853	4,615
CENTRAL												
Adams	120	--	588	12	--	2	--	673	308	2,865	303	106
Chippewa	1,268	9	5,303	165	19	288	--	4,608	3,918	3,271	184	605
Clark	999	11	7,236	559	16	730	--	6,776	7,440	1,538	710	252
Eau Claire	212	6	1,508	135	3	260	--	1,623	1,467	573	162	99
Jackson	225	--	2,410	122	4	108	--	1,753	3,431	808	358	59
Juneau	119	--	535	26	1	6	--	997	888	996	326	73
Marathon	1,261	70	2,488	808	34	2,770	--	5,614	4,657	1,786	285	241
Marquette	15	--	71	13	--	19	--	136	140	163	9	20
Monroe	27	--	555	17	--	31	--	354	470	141	30	125
Portage	551	2	712	101	17	66	--	1,333	1,017	372	76	56
Waupaca	69	3	283	173	1	81	--	1,444	1,564	482	40	46
Waushara	26	--	120	15	--	4	--	182	146	261	12	18
Wood	147	--	1,205	86	2	76	--	1,341	2,320	405	150	41
Total	5,039	101	23,015	2,233	97	4,442	--	26,835	27,766	13,660	2,648	1,740
SOUTHWEST												
Buffalo	3	--	56	6	--	1	--	68	47	14	9	--
Crawford	--	--	--	--	--	--	--	10	--	--	--	--
Dunn	130	--	585	23	1	5	--	689	352	475	38	86
Grant	--	--	--	--	--	--	--	--	--	--	--	--
Iowa	--	--	--	--	--	--	--	--	--	--	--	--
La Crosse	5	--	103	10	--	2	--	123	85	25	18	1
Lafayette	--	--	--	--	--	--	--	--	--	--	--	--
Pepin	--	--	--	--	--	--	--	--	--	--	--	--
Pierce	--	--	--	--	--	2	--	2	2	--	--	--
Richland	--	--	--	2	--	--	--	7	13	13	1	--
Sauk	3	--	57	6	--	1	--	183	163	15	9	1
St. Croix	--	--	129	2	--	10	--	9	9	--	--	--
Trempealeau	16	--	132	8	--	17	--	144	129	68	14	28
Vernon	--	--	--	--	--	--	--	--	--	--	--	--
Total	157	--	1,064	58	1	38	--	1,234	800	609	89	117

(Table 11 contined on next page)

(Table 11 continued)

Unit and county 1/	Species group											
	Bass-wood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwood
SOUTHEAST												
Brown	20	--	8	10	1	--	--	74	81	17	2	2
Columbia	1	--	22	4	--	1	--	33	32	19	5	--
Dane	2	--	44	4	--	1	--	52	36	10	7	--
Dodge	--	--	--	--	--	--	--	--	--	--	--	--
Door	--	--	1	1	--	--	--	12	12	--	--	--
Fond Du Lac	--	--	2	2	--	--	--	14	14	--	--	--
Green	--	--	5	1	--	--	--	7	5	1	1	--
Green Lake	1	--	10	2	--	--	--	16	15	14	2	1
Jefferson	--	--	--	--	--	--	--	--	--	--	--	--
Kenosha	--	--	--	--	--	--	--	--	--	--	--	--
Kewaunee	--	--	1	--	--	--	--	3	3	--	--	--
Manitowoc	--	--	14	13	--	--	--	107	107	--	--	--
Milwaukee	--	--	--	--	--	--	--	--	--	--	--	--
Outagamie	40	--	194	41	--	4	--	370	322	82	33	3
Ozaukee	--	--	--	--	--	--	--	--	--	--	--	--
Rock	--	--	--	--	--	--	--	--	--	--	--	--
Sheboygan	--	--	--	--	--	--	--	--	--	--	--	--
Walworth	--	--	--	--	--	--	--	--	--	--	--	--
Washington	--	--	--	--	--	--	--	--	--	--	--	--
Waukesha	--	--	--	--	--	--	--	--	--	--	--	--
Winnebago	2	--	29	3	--	--	--	36	27	10	5	--
Total	66	--	331	81	1	6	--	725	654	154	56	6
State total	50,854	4,448	290,140	16,916	1,172	24,829	--	226,242	172,900	70,537	13,675	12,543

1/ Includes only those counties that supplied pulpwood in 1992.

Table 12.--Central States pulpwood production by State and destination, 1987-1992

(In thousand standard cords, unpeeled)

Year	Illinois			Indiana			Iowa			Missouri		
		Destination			Destination			Destination			Destination	
	Total	Central States	Other States	Total	Central States	Other States	Total	Central States	Other States	Total	Central States	Other States
1987	91	35	56	178	76	102	23	23	--	111	29	82
1988	92	38	55	179	73	106	26	26	--	101	24	77
1989	92	32	60	170	68	102	25	25	--	109	18	91
1990	76	33	43	189	75	114	14	14	--	95	19	76
1991	81	37	44	157	56	101	14	14	--	87	17	70
1992	77	33	44	150	49	101	12	12	--	116	22	94

Table 13.--Trends in receipts of roundwood and residue as pulpwood, Central States, 1988-1992

(In thousand standard cords, unpeeled)

Type of material and area	1988	1989	1990	1991	1992
Roundwood					
Illinois	–	–	–	–	–
Indiana, Iowa, Missouri	62	53	44	44	33
Total	62	53	44	44	33
Residue					
Illinois	–	–	–	–	–
Indiana, Iowa, Missouri	99	91	97	85	83
Total	99	91	97	85	83
All material	161	144	141	129	116

The United States Department of Agriculture (USDA) Forest Service is a diverse organization committed to equal opportunity in employment and program delivery. USDA prohibits discrimination on the basis of race, color, national origin, age, religion, sex, disability, political affiliation and familial status. Persons believing they have been discriminated against should contact the Secretary, US Department of Agriculture, Washington, DC 20250, or call 202-720-7327 (voice), or 202-720-1127 (TDD).

Printed on recycled and recyclable paper.

Hackett, Ronald L.; Piva, Ronald J.
1994. **Pulpwood production in the North-Central Region, 1992.** Resour. Bull. NC-159. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 41 p.

Lake States pulpwood production increased to 8.8 million cords in 1992. Central States pulpwood production increased about 5 percent—from 339 thousand cords in 1991 to 356 thousand cords in 1992. Pulpwood production is shown by county and species group for Michigan, Minnesota, Wisconsin, Iowa, Missouri, Illinois, and Indiana.

KEY WORDS: Roundwood, whole-tree chips, residue, Minnesota, Michigan, Wisconsin, Illinois, Iowa, Indiana, Missouri.

Our job at the North Central Forest Experiment Station is discovering and creating new knowledge and technology in the field of natural resources and conveying this information to the people who can use it. As a new generation of forests emerges in our region, managers are confronted with two unique challenges: (1) Dealing with the great diversity in composition, quality, and ownership of the forests, and (2) Reconciling the conflicting demands of the people who use them. Helping the forest manager meet these challenges while protecting the environment is what research at North Central is all about.